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VOLUME XX | NOVEMBER 23, 1931 | Number 23

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Contents of This Issue

Contents of previous issues can be found by consulting the Industrial Arts Index at your library

November 23, 1931

The Effect on Wool of the Temperature and Hydrogen Ion Concentration of the Scouring Bath 743
By G. Milton Barmore

An Introductory Study of Textile Microbiology—Chapter II 747
By William G. Chace

A Random Rede on Research..... 749
By J. F. M. Leaper

Design Patent Revisionists in the New Congress 763
By Waldon Fawcett

Dyeing Vat Colors on Piece-Goods..... 765
By W. Williams

Olein and Wool Textiles..... 767
By H. Stadlinger

The Tannin Discharge Style in Calico Printing 769

Technical Notes from Foreign Sources.... 771

Proceedings of the American Association of Textile Chemists and Colorists

Annual Meeting News .....(325) 753

Report of Sub-Committee on Light Fastness—Fade-Ometer Tests with a Corex-D Globe .....(326) 754
By William H. Cady and William C. Smith

Seventy-Fifth Council Meeting .....(328) 756

November Meeting Northern New England Section .....(330) 758

Report of Sub-Committee on Standard Methods of Determining Sizing and Finishing Materials in Textile Fabrics .....(351) 759
By Russell W. Hook

Applicants for Membership .....(351) 759

Calendar of Coming Events.....(352) 760

Editorials:

Survey of Textile Research..... 761

Relief and Trade Associations..... 761

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Right — Photomicrograph showing crystalline structure of Sulfogene Carbon 4G grains.

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VOLUME XX NOVEMBER 23, 1931 NUMBER 23

The Effect on Wool of Temperature and Hydrogen Ion Concentration of The Scouring Bath*

By G. MILTON BARMORE

Such investigations of the effects of temperature, alkalinity, and concentration of the scouring bath on wool, which have previously been published, contain very little definite information regarding the actual results which one may expect to obtain in the commercial washing of raw wool. This paper concerns the investigation of the effects on the tensile strength and resulting whiteness of the wool for immersion for different lengths of time in different scouring baths of various temperatures and alkalinities.

THE comparison of the tensile strength and whiteness of the wool before and after treatment may be said to give a representative value of the treatment received.[1] The limitations of the effects of temperature, alkalinity, and concentration of the scouring bath on wool have been touched upon in former investigations. In one of these investigations, the temperature best suited for the scouring of raw wool was found to be from 38 to 55° C.[2] However, this is a fairly wide range, and as the temperature of the scouring bath is quite noticeable in its effect,[3] a more definite knowledge is desirable. It is also known that a rise of temperature as small as 1° C. has a noticeable effect on the product,[4] other conditions remaining the same. Other investigations deal with the soap concentration, and from these the proper soap concentration seems to be from 0.3 to 0.4%.[5, 6] Along with the soap concentration, we are concerned with the alkali concentration, but it is found that the degree of cleansing action seems not to be dependent on the concentration of the alkali but depends on the pH value or alkalinity. The results of Chapin[7] in his investigations show this to be true.

Apparatus and Material

Of the apparatus used, the tensile strength testing machine was the only apparatus of laboratory construction. To test the wool yarn, the yarn was first clamped between two wooden clamps, which were spaced 10 inches apart under a tension of 2.5 grams. The top clamp was connected to the recording scale and was pulled at a uniform rate of 1 foot per minute. The accuracy of the machine was estimated to be within 0.1 pounds, the maximum load of the machine being 10 pounds. To determine the color of the wool, a K. & E. Color Analyzer was used to measure the intensities of the lights of different wave lengths.

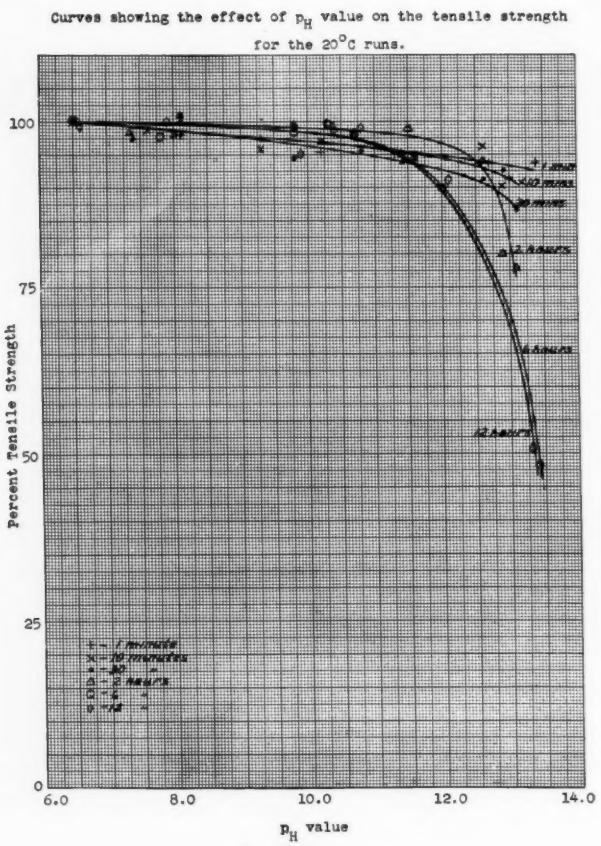
The investigation was divided into two parts: first, that to find the effect of hydrogen ion concentration on the washing of raw wool. For the first part a white commercial worsted knitting yarn of 100% wool fiber was used as there should be no change of color due to the cleansing of the wool, and second, the effect of the treatment on the tensile strength of the fiber is easier and more accurately determined. For the second part of the investigation, 1/4 Merino Canadian raw wool was used. Thus the dirt removing action of the immersion bath could be determined.

Procedure

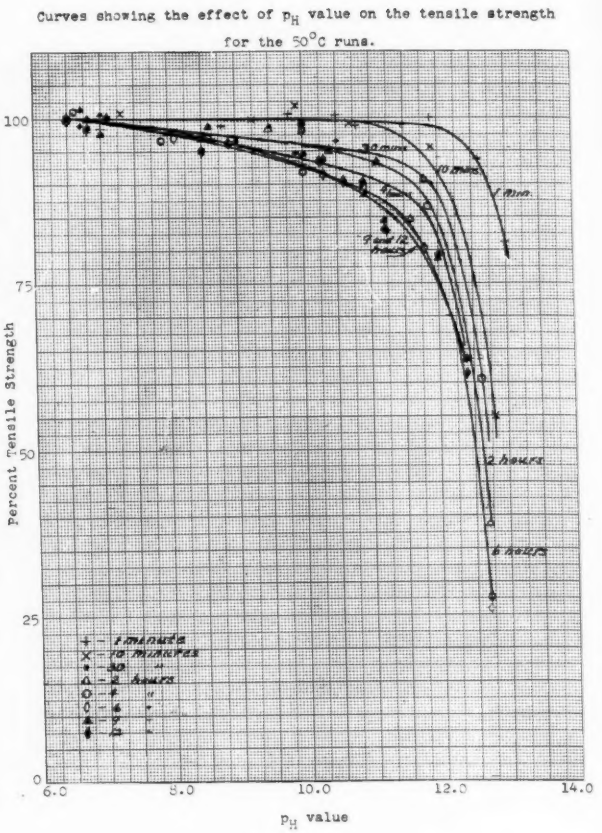
Due to the nonuniformity of the tensile strength of the yarn, ten strands were tested, the average giving a representative value of the effect of each treatment on the yarn. These ten strands were cut from consecutive parts of the yarn thus distributing any nonuniformity as much as possible. The decoloration of the wool was determined from a 3 yard piece of the same yarn which was given the same treatment as the ten smaller pieces, at the same time.

The strands were loosely wound around a U shaped glass rod and immersed in 200 ccs. of a mixed solution which had been heated to the desired temperature of the treatment before immersion, the temperature varying from 20 to 80° C., thus including all practical temperatures for scouring baths. The mixed solutions, vary-

*Presented as a Thesis for the Degree of M.Ch.E. at Rensselaer Polytechnic Institute, Troy, N. Y.



Graph No. 1.



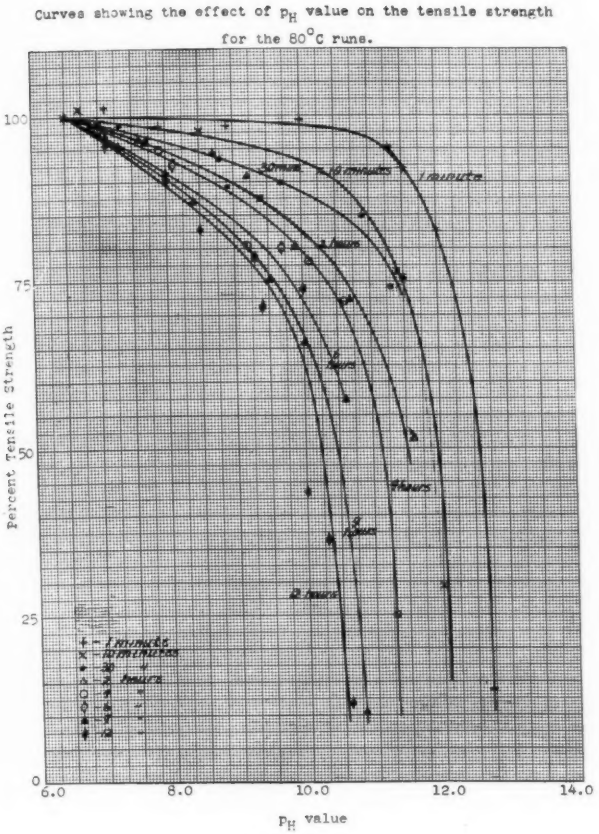
Graph No. 2.

ing in pH value from 6.5 to 13.5, were made from 0.2 N solutions of $NaHCO_3$, Na_2CO_3, NaOH, and in cases of pH values below 8.0, distilled water was used to mix with the $NaHCO_3$ solution. Thus the Na^+ ion concentration was always the same (0.2 N) except for those solutions having a pH value below 8.0. However, from the results it is seen that the slight change of the concentration of the Na^+ ion in the latter case produced no apparent error. This dilution of the Na^+ ion had to be, as a salt solution (0.2 N) had a detrimental effect on the wool yarn which was even greater than that of the 0.2 N $NaHCO_3$ solution.

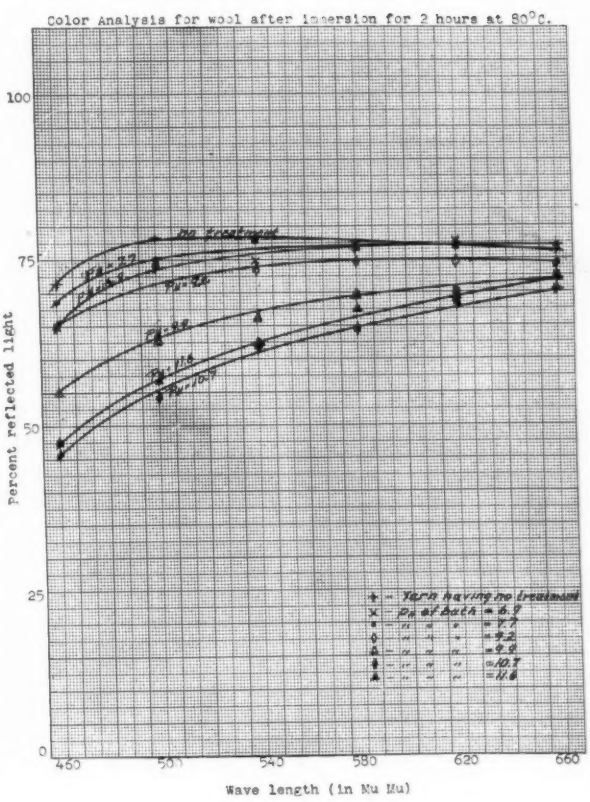
A few preliminary investigations were made to find the effect on immersing wool yarn in distilled water at various temperatures, and to find the result of removing any grease that might be in the wool. It was found that a water treatment at the temperatures investigated (20 to 80° C.) had no effect on the tensile strength of the wool if dried before testing, and that an ether extraction of the wool likewise had practically no effect on the tensile strength. Therefore any detrimental action on the tensile strength of the wool must be due to the substances dissolved in the water.

After immersing the wool yarn in the bath, the container was placed in a constant temperature oven (± 0.5° C.) for a period of time varying from 1 minute to 12 hours, after which it was removed and placed through a series of rinses consisting of the following: first a 1 minute rinse in distilled water, followed by a 2 minute rinse both of which removed most of the adhering alkali. This in turn was followed by a ½ minute rinse in a 0.05N HCl solution that changed any remaining alkali to salt, which was removed by the last rinse consisting of 1 minute rinse in distilled water. After each rinse, ½ minute was allowed for draining, and at the end of the last drain period, the "loose" water was gently squeezed out, the pieces of yarn unwound, and the wool blotted so as to remove all the water possible. It was then dried in a humidifier for a period of 12 hours at a temperature of 26° C., the relative humidity being 65%.

The pH value of the bath solutions was determined after the wool had been immersed and removed. This value was used in preference to the average of the final and initial values because the pH values of the hot $NaHCO_3$ solutions increased in value on the immersion of the wool due to the changing of the $NaHCO_3$ into Na_2CO_3, CO_2, and H_2O. Hence the average value in this case would be far more in error than the final reading itself. The maximum error was found to be 0.2 pH units for a 0.2 N NaOH solution having a pH value of 13.5. All pH values were determined by the colorimetric method. After the yarn had been dried for a period of



Graph No. 3.



Graph No. 4.

12 hours, the ten short strands were tested for their tensile strength. Following this, the 3 yard strand was wound around a glass slide as tightly and as uniformly as possible giving a fairly uniform and smooth surface with 30 ± windings per inch. The slide was then analyzed for color by finding the per cent of light reflected for the following wave lengths: 460, 500, 540, 580, 620 and 660 mu mu. Both sides of the slide were analyzed to obtain an average value.

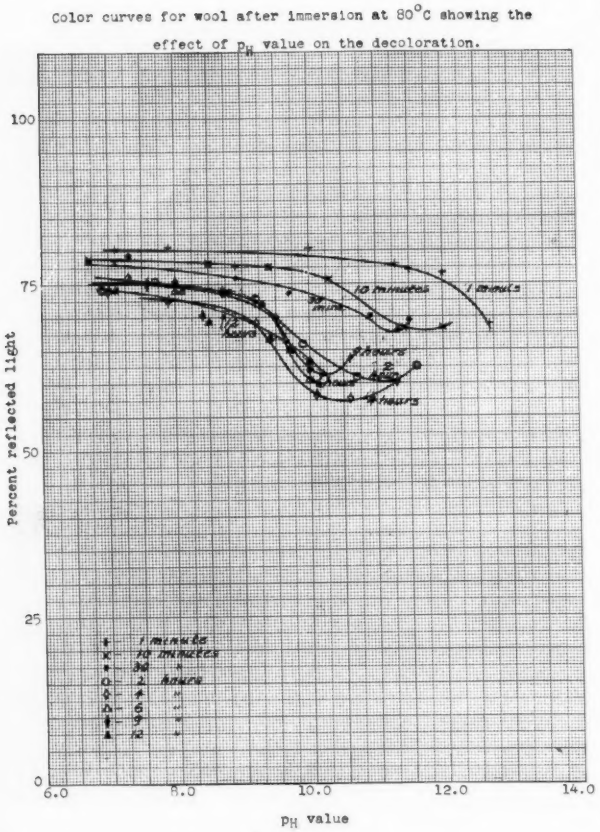
For the second part of the investigation, the effect of hydrogen ion concentration on the washing of raw wool, the 1/4 Merino raw wool was first carded until it presented a fairly uniform color, and was then weighed out in units of 2.5 gms. each. The units were each washed in 500 ccs. of a washing solution containing 0.35½% soap. six units being washed at the same time. These six units were at the same temperature and were washed for the same length of time, the pH value varying from 9.5 to 12.0 by approximately 0.5 units, the values being obtained by adding varying amounts of a 1% solution of NaOH.

On examining the results of the first part, it was decided to investigate three temperatures, namely: 30, 50, and 70° C., and to run a 3, 5, and 7 minute wash period for each temperature.

The six unit solutions were brought up to the desired temperature of the run, and the 2.5 gms. units after being placed on the surfaces of the baths, were plunged under. During the wash period the wool was dipped every ten seconds. At the end of the wash period, the wool was removed and put through three one-minute rinses in beakers containing one liter of water each, where it was dipped every ten seconds. Following each rinse, ½ minute was allowed for drainage and at the termination of the last rinse, the "loose" water was squeezed out of the wool and the wool allowed to dry in atmospheric conditions.

For the first two runs, the pH values of the wash solutions were determined before and after the washing period. As it was found that the pH value was practically constant during the run (maximum variation = 0.2 units) the pH value recorded was that of the solution after the wool was washed.

The units of the nine runs (3, 5, and 7 minute periods at 30, 50, and 70° C. each) were arranged vertically according to ascending pH values. They were examined for thoroughness of washing and for any burning that might have taken place; the latter being determined by the harshness to the "feel," the resilience, and the color. No apparatus was used for this comparison.



Graph No. 5

Results and Discussion

Wool fiber as classed by Speakman,[8] is an amphoteric colloid based on the theory of Emil Fischer, that it is chemically a complex combination of amino acids. Speakman also found the isoelectric point of wool to be at a pH value of 4.8. All commercial scouring baths have pH values above this and for such values, the complex molecule can only react with a cation, similar to the following equation:

$$(R\begin{matrix}-NH_2\\-COOH\end{matrix} + Na^+ + OH^- = (R\begin{matrix}-NH_2-H_2O\\-COONa\end{matrix}$$

As before mentioned, wool which was immersed in water at various temperatures and redried, lost none of its tensile strength. In connection with this, it might be stated that the pH value of the water bath was reduced from around 6.3 to approximately 4.6 by the immersion of the wool.

From graphs Nos. 1, 2, and 3, we can easily follow the effects of increasing the pH value. At first the loss of tensile strength is negligible and as the OH- ion concentration increases, the tensile strength decreases in proportion. At a certain pH value, the rate of decrease in the tensile strength seems to become much greater which is probably due to the surface of the reaction getting inside the layer of epithetical scales. On acidifying the immersion bath after the wool had been immersed and removed, it was found that the protein that had been dissolved from the yarn could be reprecipitated. On filtering and weighing the precipitate and comparing the amount with the tensile strength of the resulting wool, an approximate direct proportion could be formulated between the loss of tensile strength and the weight of the precipitate obtained.

From graphs Nos. 1, 2, and 3, values of tensile strengths were taken from the curves to show the effect of temperature, the pH value being the same for all values taken. From these it was found that for every 13 to 14° C. rise in temperature, the loss in tensile strength was doubled. Hence the lower the temperature used in the scouring bath, the higher the resulting tensile strength of the wool will be.

Using the values of tensile strength for the same temperature and pH value, and plotting the same against the time period, it was found that the rate of reaction is quite rapid at first and slowing down as the time period increased until in some cases it tended to approach a minimum.

The effect of hydrogen ion concentration on decoloration of wool is very similar to its effect on the tensile strength. Graph No. 4 shows the color analysis curves for wool after immersion for 2 hours at 80° C. in solutions of different pH values. These curves are representative of the curves for all color analyses made and it may be seen that as the pH value of the solution is increased, the decoloration becomes greater for each wave length except for that wool which was immersed in solutions of the highest pH values, the color analyses of which lie completely above the curves of the next lower pH values. For instance, in graph 4, the color analysis curve for wool which was submerged in a solution of pH value = 11.6 is totally above that submerged in a solution of 10.7 in pH value. As these curves all have the same general form and direction, an average of the six values of each curve was made and this plotted against the pH value of the solution in which the wool was immersed for treatment.

From these curves, which are on graph No. 5, it may be seen that decoloration is increased as the pH value of the immersion solution increases until a maximum occurs, after which the color becomes lighter due to the coloring matter becoming soluble. In each case the minimum decoloration occurred when the tensile strength was from 60 to 70% of the original amount.

On examining the washed units of raw wool, it was found that they could be grouped into three classes. The "unclean" group consisted of practically all units washed at 30° C., the exceptions being those washed for 7 minutes in solutions having pH values of 11.5 and 12.0 respectively. These last two units were clean and were classed in the "clean" group together with most of those washed at 50° C. and those of the 70° C. group which were

(Continued on page 764)

An Introductory Study of Textile Microbiology—Chapter II

By **WILLIAM G. CHACE**
Instructor in Chemistry and Microbiology, Lowell Textile Institute

In the first part of this series (American Dyestuff Reporter, Nov. 9, 1931) were considered the organisms concerned in the attack on textile materials. It is now necessary to consider the action on the various fibers in detail. When we examine the action of these various organisms on the textile fibers, we have to divide our study definitely into a study of cotton, wool, silk, and artificial silks.

Cotton

In the case of cotton, by far the greatest amount of work has been done on the molds. This is not by any means because other organisms are absent, but the molds are the largest and easiest to study superficially. For that reason (although as will be shown, a scientific study is more difficult here than in the case of bacteria) the earliest workers assumed all effects due to molds. In view of this much of their work must be discounted and allowance made for the fact that the cultures which they assumed were molds, were mixtures of molds and bacteria.

The effect of molds is threefold. (1) The mold may stain the material by its colored spores or by pigment formation. This is by far the most common type of damage to cotton materials. (2) It may attack the cotton fiber in such a way as to seriously tender the cloth or even cause it to fall apart altogether. Molds alone are very slow in tendering effect and except in cases of long storage in damp warehouses or shipment to foreign countries, this is an improbable type of damage. (3) The mold may produce acids in the fiber and so change the reaction that dyes already applied are changed, or dyes later applied will dye unevenly. Any one or any combination of these types of damage may take place on cotton at any stage of its manufacture where it is allowed to stand in a damp, warm atmosphere.

While most bacteria will not grow on pure cellulose because it contains no nitrogen, a necessity for bacterial growth, there are usually, especially on unbleached cotton, enough other substances besides pure cellulose present to allow growth to take place. Some investigation has been made of the action of bacteria on cotton, and it has been found that these organisms act on cotton in two ways. First, there is a group of organisms known to be definitely cellulose decomposers. These have been studied by soil bacteriologists and it is known that given the proper conditions they will grow and produce enzymes which will destroy cellulose producing from it much simpler products, fatty acids, methane, hydrogen, carbon dioxide, etc. When bacteria of this type act on cotton it is obvious that serious tendering will result. These bacteria are natural inhabitants of the soil and many will grow only in this medium. These cellulose destroying bacteria are present on the cotton, picked up from the soil either on the bolls or by piling the bales on the ground. Proper conditions of dampness, warmth, and especially the exclusion of oxygen will cause the organisms to grow and damage the cotton. Second, there is another action shown to be the result of the growth of organisms which are not true cellulose decomposers. It is not known just how many types can produce this kind of damage, but it is reported[6] to be produced by two organisms which are so very numerous (Bacillus subtilis and B. mesintericus) that they seem to be present everywhere in large quantities. The exact action in cases of this kind of destruction is not known, but Doree[7], who has investigated the product of the decomposition, suggests that it may be mechanical in some way because this product does not show the same chemical properties as cellulose decomposed by enzymes of cellulose decomposing bacteria, but has chemical properties almost identical with those of powdered cellulose. Since this kind of damage is caused by such common bacteria, it is possibly much more important to the mill man than that caused by true cellulose decomposers which do not thrive well outside the soil.

There is also the little investigated action of molds and bacteria together. In this case it has been shown by Denham[8] that molds can split the cuticle without, however, seriously tendering the cotton. If bacteria are present, however, they enter through the splits in the cuticle and are able to attack the inner cells more quickly. This means that while molds or bacteria alone would not quickly affect the yarn, the two working together will cause an effect much more serious.

Wool

It has been said that cotton, if pure, is not an ideal food for microorganisms. Wool, however, contains nitrogen and is therefore a good natural medium on which

to grow these organisms. Burgess[9] states that bacteria are to be reckoned with first in the destruction of wool, as molds cannot grow without the preliminary action of bacteria in changing the constitution of the fiber. Conditions in wool are ideal for the growth of bacteria. Wool contains larger amounts of moisture than cotton under similar conditions, and it contains nitrogen in the proper combination to be available. Hirst[10] concludes that tendering in rotted wool is entirely due to bacteria, and uneven dyeing to mold growths. On the other hand, Trotman and Sutton,[11] working with pure cultures, found bacterial action gave an increased affinity for acid and direct dyestuffs but no change in affinity towards the basics. This makes bacteria one of the causes of uneven dyeing. These authors state that decay proceeds in the following stages: (1) destruction of the epithelial cells; (2) exposure and liberation of the cortical cells; (3) complete disintegration of the fiber. As with cotton, uneven dyeing may be due to a change in the pH of the material. This may be caused by either molds or bacteria.

Silk

That silk is not more readily attacked by microorganisms is something to be wondered at, because silk, like wool, contains the nitrogen so necessary for growth. Silk, however, does not seem, from the study of the literature, to be subject to any considerable damage from this source. Possibly this is due to the greater cost and consequent more careful handling of silk. A further explanation might be found in the fact that commercial silk is heavily impregnated with weighting materials. These are usually metallic salts having toxic properties towards infection. Hays and Holden[12] in an excellent article on silk have investigated the action of bacteria and molds on pure silk and silk in the gum and found that of the organisms studied, only two (Bacillus mycoides and Proteus vulgaris) produce tendering at ordinary temperatures and not many more affect the strength even at body temperature. They found discolorations to be produced by only a few colored spore molds. Although the effect is not mentioned by these authors, it is to be taken for granted that where organisms grow and produce a change in pH uneven dyeing will result. Grove-Palmer[13] reports that a number of cases of so-called mildew investigated by him were not mildew at all, but broken fibers roughened up so as to look like mildew and dye unevenly. The condition known as "lousy silk" was also once thought to be due to the action of mold or bacteria on the silk, but has since been shown to be the result of malformed silk fibers, probably produced by the silk worm in spinning the cocoon.

The Rayons

Not a great deal of work has been published on the growth of mildew on the artificial fibers. Such work as has appeared, though, seems to give the impression that the rayons are particularly resistant. This would seem logical since they are regenerated cellulose (with the exception of the acetate) and the process of manufacture would remove some of the nitrogenous impurities necessary for growth, and probably aid others of a toxic nature. Conversations of the author with those who are familiar with conditions in the rayon industries would indicate that these published results are misleading, and that the rayon industries suffer from mildew with the rest of the textile industries. Thaysen and Bunker[14] have investigated the rayons and found that their resistance to mildew increases in the following order: Cupra, Viscose, Nitro, Acetate. Here again, as with cotton, published work and the opinion of the industry would place molds as the chief offenders. It seems to the author that this may be due to the fact that molds are visible to the naked eye, hence force themselves on the attention for observation and study, while the other organisms are invisible. Although there is no published research to confirm the fact, it is probable that the action of the organisms on rayon is quite similar to the action on cotton since both are basically cellulose.

Other Substances

The organisms under discussion will grow very rapidly and luxuriantly on many substances added to the fiber in the process of manufacture. Such substances as sizes, oils (with the exception of pure mineral oil), gums, waxes, and similar organic substances are often the source of the food supporting a growth of mildew. Burgess[15] studied oils and soaps used in wool manufacture and finishing and found most to be supporters of mildew growth. Morris[16] made an extensive study of finishing compounds with results similar to those of Burgess. He especially emphasized the importance of avoiding substances containing organic nitrogen. If this mildew is not of a type to attack the fiber itself, no tendering results; but the other kinds of damage result whether the growth is on the fiber itself or on some oil, size, or finishing compound.

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16 Morris, ibid, 17:T1 (1926).

Indanthren Grey B G

The General Dyestuff Corporation sends out a circular of Indanthren Grey B G which is a new homogeneous Indanthren Dyestuff. The new color yields a full bluish grey on cotton, linen and other vegetable fibres, slightly greener in shade than Indanthren Grey 6 B. Indanthren Grey B G is said to have very good fastness to light and chlorine and excellent fastness to washing. The new dyestuff is also recommended by the manufacturer for printing purposes.

A Random Rede on Research

By **J. M. F. LEAPER**
Research Chemist

In this latter day period when whatever business there is, is obtained only by the hardest kind of uphill work and when sales managers are getting gray-haired overnight trying to make a showing with the aid of a disheartened sales force, it certainly devolves upon a wide-awake research department to step into the breach and justify the judgment of the management in spending money and thought upon its organization during the piping time when profits were fat and easy and sales managers' morning hours were of necessity partly spent in neutralizing with bromoseltzers and Pluto water the hang-overs of the harmless but necessary get-together parties which were about all that were requisite in those halcyon days to get the business; when the whole nation was on a buying spree and the slogan of the customer was "when can I get delivery" rather than "I can buy a better product at two cents less from Blank & Co."

IN FORMER days one of the most necessary functions of a sales manager's secretary was the interviewing of mysterious strangers who delivered strange-looking packages which were carefully put away and the contents (after being tested for "wood" by the chief chemist) utilized *ad lib.* as the sinews of war in the front trenches of the campaign for the capture of the most dollars for the least service. That was the era when the star salesman sallied forth with a bottle of pre-war in one hand and a twenty spot in the other, and his most indispensable qualifications were a good digestion and an easy conscience rather than any special technical knowledge of the goods he sold, and his monthly pay check made the chief chemist wonder why he was such a chump to waste his time in burning the midnight oil studying the orbits of the atoms rather than cultivating a taste for distinguishing real Canadian Club from four times cut Montauk Point Rye.

Now when the time is at hand when as one old-timer sagely and sadly puts it "all the bull is gone out of the selling business" and the onus of proof is on the salesman to demonstrate that all his fairy tales mean something more than those of the other fellow, it is going to be the organization with the properly designed and operated research department functioning for a period of years that will get the lion's share of whatever business there is now, and reap a real harvest when the upturn comes as it will with the inevitability of the pendulum's upswing. The business that has been wrapping up its ultra aqueous products with many layers of the before-mentioned "bull" and depending on the diplomatic enriching of the mill superintendent's exchequer by adroitly transferred yellow-backs to get by, is going to go by the board; and the firm that has been making intelligent use of a well-planned research program to devise products of real sales appeal that can be, for example, demonstrated to add qualities to a fabric making it worth twenty-five cents a yard more at a cost to the mill of only one cent a yard or cut down three operations involving two days' processing to one operation of four hours giving a superior product, that firm is going to find its salesmen welcomed with a glad hand and made to feel they are working for the best firm in the world and as a consequence get so pepped up with renewed confidence that they will be able to turn in three times the orders and with less effort.

Now there are of course mighty few organizations doing any sort of business with the textile trade who would admit they don't have some department which is honored by the name of research department, but some of the layouts that pass muster as such and the work that is designated as research work would surely make Faraday turn in his grave and give severe mental indigestion to Pasteur.

Value of Real Research

As to the value of real research there should be no question. The pseudo research that goes under the name in some quarters where the motions of "doing research work" are gone through is always of doubtful utility. It is conducted sometimes by engaging chemists trained and too much trusted by competitors and some companies really delude themselves that for instance a change in the strength of sulfuric acid used in a reaction or the magic breathing of an aura of "pH" over a worn-out formula constitute noteworthy technical advances.

Development of really new ideas, utilization in new directions of former industrial wastes, the kind of research that has made the American meat packing industry a proverbial example of the utilization of by-products, the research which really creates something new or many times enhances the value of a natural product can never be accused of failing to justify the money spent upon it.

To give a concrete example, it has been estimated that a pine tree in the forest is worth about $10.00 a ton, cut down and trimmed it goes up to $15.00 a ton, converted to paper pulp it jumps to $55.00 a ton, change this to rayon and the price is now $5,500.00 a ton, just 550 times its original value, and the increment is due entirely to research in the pulp and textile industries.

Building a Research Organization

The building up of a research organization which can accomplish such things is a matter that cannot be hurriedly undertaken. The seed must be planted, the seedling cared for so that its growth takes place in the form and direction desired and when in full bloom and producing satisfactory results constant attention is necessary to keep it in healthy condition and conserve its fruits for the longest possible period.

First and foremost the man in charge of research work must be responsible directly to a sympathetic and active member of the firm who is fully conversant with the general demands of the industry. Many an excellent and thoroughly competent research director has been disillusioned because of conditions which require him to report through an unsympathetic plant manager who was mainly interested in the preservation of his own antiquated methods and who saw in every suggested improvement only more grief for the operating force. Suggestions for research work may of course rightly come from all quarters including the research head himself, but these should be sifted down and evaluated by the official in charge of research in consultation with the research chief, due consideration being given on each proposition to expediency, the chances of a quickly successful conclusion, the question of commercial disposition of possible by-products and finally the sales department's estimate of possible sales and profits, all these things and others determining the order of importance on the slate for new work and the amount of time which can be allocated to each item.

The question of engaging chemists is also something in which the research head should be given considerable voice. After all, his men are the tools with which he is to work and attempt to achieve results, and it should be an obviously necessary thing that he should have an opportunity to look over his tools before use and judge whether they are likely to be of use to him in the campaign he is planning. Too often a chemist is engaged through friendship with a company official or some other extraneous reason or perhaps because he happens to be engaged in making a product for a competitor which is to be copied or imitated. After the immediate end is achieved it may happen that the chemist does not fit in at all with the method of working used in the particular organization and has to be let go. In this connection it is impossible to use language too strongly in deprecation of the only too common practice of endeavoring to obtain information as to competitor's products by hiring his chemists. Nearly always it is the case that a steadily conducted and well-planned research attack from first principles on a specification wanted for a certain industrial process will result in obtaining a product superior to that gotten by a hurriedly conducted and unethical grab of the competitor's chemist, and the question as to how to get rid of him subsequently, since a chemist who will in this peddle around his employer's trade secrets is not a desirable member of the staff, will not have to be faced to the disorganization and loss of confidence of the rest of the force.

Requisites of a Research Worker

It may here be emphatically stated that the greatest stress should be laid on endeavoring to avoid unnecessary turnover of chemists particularly in a research organization. It should be obvious that in research work a continuous policy and continuous working force is a requisite of success, but this self-evident truth is often grossly overlooked in company policies. Use every legitimate means to get the very best staff your budget affords and then to quote the bard "grapple them to thy soul with hooks of steel." Loyalty is in my opinion ninety per cent of what is requisite in a research man. If he gets the idea from seeing chemists come and go, rightly or wrongly, that it is only a question of time before the axe will fall on his neck, then he is perhaps unconsciously but nevertheless surely going to substitute his personal viewpoints for that of the company in every bit of work he does in the laboratory or plant to the obvious disadvantage of the firm.

The next important thing for a research worker to be inculcated with by his director is that he is going to be responsible for his own process or product from the time he first conceives his idea till it is on a regular manufacturing schedule and all possible difficulties regarding application to its ultimate purpose have been ironed out. It is a mistake to regard the research worker as one who only is concerned with the beginnings of a product in the laboratory, leaving to others the production on a large scale and the application of the finished product in industry. Nothing contributes so much to the self-confidence and *esprit de corps* of a chemist as being made to feel that his is the hand that is going to guide his brainchild through the period when it learns to walk unaided and be in at the finale when the completed product makes its bow to industry in the form of a worth-while and useful member of the Society of Commercial Successes.

If on the other hand he realizes that his idea is to be snatched from him before it is scarcely out of the cradle, given to another unsympathetic hand to evolve into a manufacturing process, possibly falling undeserved by the wayside at the stage due to the fact that the second chemist feels it is not his baby and prefers to foster something of his own; and even assuming it has reached the manufacturing stage safely it is passed on to a third man who because he again has his own line of pet products makes only a half-hearted trial with it in its mill application, then it is more than likely that a tremendous amount of waste motion can be produced without anything else being achieved except a black eye for the research department.

Not that I am advocating that a chemist should be a jack of all trades and attempt to do work which for instance might be better done by an experienced textile operator. But whenever a chemist is, as the doctors say, "indicated" for a particular job, let it be that chemist whose product is involved in the assignment and better

work and greater chance of success will result. Also when the stage of the application of his product in actual use is reached let the chemist be fully informed and consulted with regarding any difficulty experienced with his product. He can tell best and quickest if his original research work has been properly done, just where he can make the necessary changes to fit his product completely into the conditions it has to meet.

Laboratory Conditions

Regarding the laboratory working conditions, it should be unnecessary to state that laboratory facilities should be the best that can be provided consistent with the type of work intended to be engaged on. *After all, the time of a good chemist is something of considerable value to his firm, and equipment which is not designed to economize his time to the greatest degree so that his brain and hands are employed mainly in constructive thought and work rather than in trying to perform simple mechanical acts with inadequate apparatus, is a very poor economy in the long run.* Neatness and order are of course necessary in everything but sometimes too much stress is laid on these things. In the stages of evolution of any well thought out and carried through success there are bound to be times when it might appear to the outsider that order had gone by the board, but if the train of thought carries through to a successful conclusion and the battle is won, what matters it if the battlefield appeared to be somewhat disordered in the heat of midday. One of the neatest "chemists" I have ever come across never went home any evening until his laboratory bench was completely cleared of any and every evidence of work having been done there during the day. Needless to say his accomplishments were exactly zero.

Don't let a chemist get easily discouraged. It is surprising what a little word of encouragement tacked on to a useful suggestion will do to a man's morale. Also don't let a chemist get too optimistic when he seems to have made a brilliant new discovery. Remind him of the weak points and make him work out all the details necessary to make the discovery foolproof. Napoleon had a famous saying when advised of some important victory of any of his generals. He would ask, "And what did he do the next morning?"

There is always a next morning when a solution to a problem doesn't look quite so complete and all-embracing. This is the occasion when we get in our hardest work in consolidating the advances we appear to have made and protecting them from flank encroachments by the army of objection that are bound to arrive when the sales manager says, "You've got to show me."

On the whole it is perhaps better to err on the side of overpraise rather than over-criticism. Some so-called executives who have never done any research work themselves and have very little cognizance of the problems to be solved and brain-teasing work that any chemist worthy of the name must go through to accomplish anything of real value, find themselves by the faulty judgment of the company's directors in charge of research work, and make the mistake of badgering the chemist on a tough problem and requiring progress reports almost from day to day and pressing for half-cocked results before the problem is ripe for real solution. Such directing does the company an ill-service as the chemist turns his attention then, perhaps unconsciously, mainly to producing half-results to satisfy the pestering of his superior for something to report.

Pick your chemist for the job and then let him work it out according to his own judgment with a minimum of interference and offer only general suggestions in a diplomatic way. Get him to put a date himself on the time you may expect a report, and don't bother him till then. If your chemist does not get results this way, get one who does. Self-reliance is a quality more necessary in a research chemist than in many other walks of life. Chemists that can be treated as cattle are not of the calibre on which any hopes for a successful research department can be built.

Finally a research chemist is usually a rather sensitive fellow. After all, his greatest reward is the appreciation of his employers for results achieved and it is surprising how far a few words of praise will go in spurring him on to further efforts. With the best types of men a little commendation is thought more of than an increase in salary and the reverse is very much the case.

In this connection and in conclusion I will relate one of the most stupid incidents I ever heard of which happened to a chemist friend of mine some years ago. An official and large stockholder was showing around a visitor through the newly built and equipped research laboratories which were the result of a far-seeing and wise decision on the part of a past president of the company. Previous to the erection of the new building all so-called research work as well as raw material analysis and plant control of a sort had all been attempted in a haphazard way in an old galvanized shed. The business just grew up like Topsy under these conditions, and as with many other similar businesses in the boom times when all kinds of products were in demand, everything "went" more by good luck than management. The company, however, wisely decided that the research work must be on a real foundation for the future and made arrangements accordingly for the proper organization and equipment. Whether the above mentioned official had been suffering from indigestion on that day or whether he lamented shortsightedly the large sums which had been spent on the building to the temporary discomfiture of his dividends is not quite clear, but he remarked to his visitor, "You will appreciate that we have a really first-class laboratory building now and a wonderful staff of chemists, but it seems to me that we turned out more new products in the old shed we had with only one chemist and a couple of sample boys than we do now with all this new equipment and apparatus." So my friend got the shock

of his lifetime to discover that he and his laboratory were only considered as a sort of sideshow to be used mainly for advertising write-ups. Needless to say he did not stay but wended his way to a place where he was not subjected to such annoyances from stupid and unsympathetic officials and that company lost a good research chemist.

The gist of the whole matter might be put succinctly as follows: Don't be a bear in the market for chemical talent. Look on your research staff as an investment for the long pull and don't sell the American chemist short.

NEW PATENTS

Abstracted by Synthetic Organic Chem. Mfrs. Assn.

Indigo Powder and Method of Making the Same. (A process of preparing a dry indigo dyestuff, capable of being readily wetted and dispersed in water, which comprises mixing a small amount of Turkey red oil with an indigo paste and drying.) Theodore L. Masterson, of Buffalo, N. Y., assignor to National Aniline & Chemical Co., Inc., of N. Y., N. Y., No. 1,827,757, October 20, 1931.

Chromiferous Azo-Dyestuffs. (Dyeing wool even red shades fast to light, washing and fulling, obtained by treating the ortho-hydroxyazo dyestuffs obtainable from diazotized ortho-aminocresol sulphonic acids free from further substituents and 1-phenyl-3-methyl-5-pyrazolone in substance with agents supplying chromium.) Hans Krikalla, of Mannheim, Ger., assignor to General Aniline Wks., Inc., of N. Y., N. Y., No. 1,828,055, October 20, 1931.

Process for the Manufacture and Production of Anthraquinone Intermediates. (For example, leuco 1:4-diaminoanthraquinone which comprises simultaneously reacting upon 1:4-dihydroxy-anthraquinone with an aqueous solution of ammonia, and sodium hydrosulphite, whereby the said 1:4-dihydroxy-anthraquinone is simultaneously amidated and reduced to said leuco 1:4-diaminoanthraquinone.) William Wyndham Tatum, of Manchester, England, assignor to British Dyestuffs Corp., Ltd., of Manchester, England, No. 1,828,262, October 20, 1931.

Preparation of Dyestuffs Which Are of Value for Obtaining Fast Tints on the Different Fibers and Process of Making Same. (Obtained by mixing with sulphite cellulose waste liquor.) Max Bommer, Guillaume de Montmollin, and Jaroslaw Frohlich, of Basel, and Fritz Grieshaber, of Riehen, near Basel, and Wolfgang Jaeck, of Basel, and Frederick Felix, of Riehen, near Basel, Switzerland, assignors to the Firm: Society of Chemical Industry in Basle, of Basel, Switzerland, No. 1,828,592, October 20, 1931.

Azo-Dyestuffs of the Pyrazolone Series and Process of Making Same. (Consists of coupling diazotized 4-amino-3-nitro-1-methylbenzene with 3-methyl-5-pyrazolone. Dyestuffs possess excellent affinity for acetyl-cellulose or cellulose esters and ethers and dye these materials yellow to orange-red non-phototrop tints.) Guillaume de Montmollin, of Basel, and Max Schmid, of Riehen, near Basel, Switzerland, assignors to Society of Chemical Industry in Basle, of Basel, Switzerland, No. 1,828,599, October 20, 1931.

Method for the Preparation of Sulphur Dyes. (A water soluble black dye characterized by being composed of the reaction product of sulphur black with sulphur and of alkali metal sulphide, and by being readily and completely soluble in water.) Albert C. Burrage, Jr., of Ipswich, Mass., No. 1,828,699, October 20, 1931.

Monoazodyestuffs. (o-Hydroxy-monoazo dyestuffs possessing good fastness properties, dyeing wool from an acid bath red shades, which change to green by afterchroming, and yielding when treated with stannous chloride and hydrochloric acid an o-amino-phenol-sulfonic acid and 1.2-naphthylenediamine-3-carboxylic acid.) Winfred Hentrich, of Wiesdorf-on-the-Rhine, Rudolf Knoche, of Leverkusen-on-the-Rhine, and Ernest Tietze, of Cologne-on-the-Rhine, Ger., assignors to General Aniline Wks., Inc., of N. Y., N. Y., No. 1,828,737, October 27, 1931.

Metalliferous Azo-Dyestuffs and Process of Making Same. (Capable of dyeing vegetable fibers, artificial fibers and animal fibers violet, blue, green and grey tints of good fastness properties, particularly to light.) Hans Gubler and Guillaume de Montmollin, of Basel, and Joseph Spieler, of Laufen, Switzerland, assignors to the Firm Society of Chemical Industry in Basle, of Basel, Switzerland, No. 1,829,646, October 27, 1931.

Manufacture of Substantive Polyazo-Dyestuffs. (Consisting in coupling a diazo-compound from 4-chloro-1-amino-benzene-3-sulphonic acid-azo-1-naphthylamine-7-sulphonic acid-azo-1-naphthylamine-6-sulphonic acid with a monoazo dyestuff obtainable by coupling in acid solution a diazo body of the benzene and naphthalene series with 2:5-aminonaphthol-7-mono-sulphonic acid, dyeing cotton green-blue tints very fast to light). Bernhard Richard, of Basel, Switzerland, assignor to Firm of J. R. Geigy, S.A., of Basel, Switzerland, No. 1,829,672, October 27, 1931.

Manufacture of Substantive Polyazo-Dyestuffs. (Relates to an improvement in above patent No. 1,829,672.) Bernhard Richard, of Basel, Switzerland, assignor to Firm J. R. Geigy, S.A., of Basel, Switzerland, No. 1,829,673. October 27, 1931.

Package Dyes

A display of Rit package dyes for tinting and dyeing is being featured at the Du Pont Exhibit on the Boardwalk in Atlantic City. In addition to showing the entire line of 33 shades and the color remover, the display stresses the new instant Rit French Ecru for faded curtains, and features marquisette curtains tinted with the new shade. The dyes are marketed by the Rit Products Corporation, Chicago, Ill.

Proceedings of the American Association of Textile Chemists and Colorists

The American Association of Textile Chemists and Colorists

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ANNUAL MEETING NEWS

PROGRAM
FRIDAY, DECEMBER 4th

1:30 P. M. 76th Council Meeting.
2:30 P. M. 69th Research Committee Meeting.
Sight Seeing Trips during the Afternoon.
6:30 P. M. Buffet Supper.
7:30 P. M. Informal Technical Session, Open Forum and Entertainment.

SPECIAL FEATURE

Tests for Color Blindness:
Dr. E. M. Smith, Arlington Mills.
A Questionnaire on Some Practical Problems of Wool Dyeing:
Prepared by Mr. John G. Masson, of the Rosemont Mill, and Answered by Dr. E. W. Pierce, of the Ciba Company.
Moving Pictures of Expedition to Venezuela:
Mr. Carlton S. Francis, Jr.
Celanese Corporation of America.
Other Entertainment.
Note:—It is planned to make the Friday Evening Session very informal. It is koped that small groups may be formed to discuss mutually interesting topics.

PROGRAM
SATURDAY, DECEMBER 5th

10:00 A. M. The use of Hydrogen Peroxide and Sodium Perborate as Oxidizing Agents for Vat and Sulphur Colors.
Mr. Peter De Leeuw,
Roessler & Hasslacher Chemical Company.

10:30 A. M. The Mechanism of the Dyeing Process.
Dr. Robert E. Rose,
E. I. du Pont de Nemours & Co., Inc.

11:30 A. M. Cotton Fiber Quality: Its Measurement in Relation to Standardization and Utilization.
Miss Dorothy Nickerson,
Bureau of Agricultural Economics,
U. S. Department of Agriculture.

11:30 A. M. Some General Considerations on the Application of Electrometric Measurements.
Dr. W. N. Greer,
Leeds & Northrup Company.

12:00 Noon. Business Meeting.
Reports of Officers.
Reports of Committees.
Election of Officers for 1932.
Any Other Business.

1:00 P. M. Recess for Luncheon.

2:00 P. M. Basic Mordants and Lakes.
Prof. Wilder D. Bancroft,
Cornell University.

2:45 P. M. The Microscope and Fundamental Textile Research.
Prof. E. R. Schwarz,
Massachusetts Institute of Technology.

3:15 P. M. The Iso-Electric Point of Wool.
Dr. Milton Harris,
Research Associate of A. A. T. C. C.

3:45 P. M. A Study of Stress-Strain Curve of Rayon.
Dr. Henry Green,
Tubize Chatillon Corporation.

4:15 P. M. Suggestions for Standardizing Sulphonated Oil Analysis.
Prof. A. H. Grimshaw,
North Carolina State College.

4:45 P. M. Two New Scouring Agents.
Dr. H. Meyer,
General Dyestuffs Corporation.

6:30 P. M. Banquet.
Toastmaster—H. D. Grimes,
Chairman Northern New England Section.
Speakers—Hon. James M. Curley, Mayor of Boston.
Bill Cunningham, Sports Editor Boston Post.
And others of National Prominence.

Proceedings of the American Association of Textile Chemists and Colorists

Report of Sub-Committee on Light Fastness

V.—Fade-Ometer Tests With A Corex-D Globe[1]

By WILLIAM H. CADY[2] and WILLIAM C. SMITH[3]

Duplicate sets of samples from 40 selected dyeings were exposed in the Fade-Ometer with a plain glass globe for one set and a globe of Corex-D glass for the other set. Comparisons of the faded samples indicate that the use of a Corex-D globe instead of a plain glass globe will not materially affect the results of fastness tests.

I. Introduction

THE Fade-Ometer commonly used for testing the fastness to light of dyed textiles makes use of a carbon arc enclosed in a globe of ordinary glass. The use of a globe of Corex-D glass has been proposed by the manufacturers. Since Corex-D glass transmits more ultra-violet radiation than plain glass, information was desired as to the effect of this proposed change on the results of fastness tests made in the Fade-Ometer. A selected series of samples of dyed textiles was exposed to show the effects of each of the two globes.

II. The Samples

The forty dyeings (see Table 1) used in these tests had been selected to show the effects of variations in the conditions of exposure[4]. Duplicate sets of samples from these forty dyeings were used. One set was exposed using the plain glass globe ordinarily supplied with the Fade-Ometer; the other set with a globe of Corex-D glass.

III. The Radiation

The principal interest here is in the difference in radiation through the two globes. Both ordinary glass and Corex-D glass transmit visible radiation freely. In the ultra-violet, the regular Fade-Ometer globe absorbs completely radiation of wave lengths shorter than about 310 mμ and its transmission increases rapidly from about 10% at 320 mμ to 90% at 400 mμ[5]. Corex-D glass transmits some radiation of wave lengths shorter than 280 mμ. It transmits about 15% at 280 mμ and about 90% at 340 mμ[5]. These differences in the transmission of the two glasses would result in considerable differences in radiation if the enclosed carbon arc emitted much radiation in the region between 280 and 320 mμ. The relative spectral energy from an open carbon arc is small in this region[6]. Enclosing the arc may result in increased radiation in the ultra-violet but it does not appear that this increase would be of great importance in the tests reported here[7]. The radiation from a Fade-Ometer arc with a plain glass globe has been measured by Coblentz and Stair (see Table 2) and their results may be compared with the manufacturers' data for the radiation from a Fade-Ometer arc enclosed in a globe of Corex-D glass. Radiometrically there is a small increase in ultra-violet radiation when a Corex-D globe is substituted for a plain glass globe (see Table 2) but, as is shown below, this causes only very small differences in the fading of the dyeing.

IV. The Exposures

One set of samples, set 113, was exposed in the Fade-Ometer with plain glass globe. Another, set 112, was exposed in the same Fade-Ometer with Corex-D globe for equal periods of time under similar conditions. All the samples in a set were exposed simultaneously for 20 hours. One-half of each of the first 20 samples of the set was covered with a metal shield and the exposures were continued for another 20-hour period. After this exposure, the first 20 samples were removed from the Fade-Ometer and one-half of each of the last 20 samples was covered with a metal shield. Exposures were then continued 40 hours longer. In this way, samples 1 to 20 in each set were exposed 20 hours in the first half and 40 hours in the second half. The two halves of samples 21 to 40 were exposed 40 and 80 hours, respectively.

In the exposures of both sets the ventilating fan supplied with recent models of the Fade-Ometer was used. The circular pan furnished with the Fade-Ometer was supplied with water throughout the tests. The extra pans and wicks for increased humidification were not used. The Fade-Ometer and fan were operated on 220-volt direct current. The energy consumed was measured by a kilowatt hour meter like those used in homes. This measurement also served to show that no interruption of the tests occurred during the night when no one was in attendance. Table 3 gives a record of the exposures.

TABLE 1.

DESCRIPTION OF THE DYEINGS AND COMPARISON OF THE FADING

Serial Number	Colour Index Number	Amount	Dye	Mfr.*	Method	Fiber	Comparison with Set 113 Set 112**
1	487	1%	Acid Anthracene Red 3BM	GA	Acetic Acid	Wool	=
2	1180	1%	Indigotine CC	GY	Sulphuric Acid	Wool	v. s. m.
3	667	1%	Erio Viridine B Conc.	GY	Sulphuric Acid	Wool	v. s. m.
4	53	1%	Victoria Violet 4BS	JC	Sulphuric Acid	Wool	v. s. m.
5	801	1%	Quinoline Yellow O	G	Sulphuric Acid	Wool	=
6	59	2%	Azo Acid Blue B	S	Sulphuric Acid	Wool	=
7	883	1%	Chrome Blue GCB	NAC	Chrome Mordant	Wool	v. s. m.
8	448	1%	Purpurine 4B Conc.	DuP	Salt	Cotton	v. s. m.
9	406	2%	Niagara Blue 2B	NAC	Salt	Cotton	=
10	620	2%	Pontamine Yellow SX	DuP	Salt	Cotton	=
11	812	4%	Primuline NAC, beta naphthol	NAC	Developed	Cotton	=
12	922	1%	Methylene Blue Zinc Free	CCC	Tannin	Cotton	v. s. m.
13	924	1%	Methylene Green	CCC	Tannin	Cotton	=
14	581	5%	Direct Black EG 200%	NCW	Acetic Acid	Silk	v. s. m.
15	518	2%	Direct Sky Blue 6B Conc.	NCW	Acetic Acid	Silk	=
16	841	2%	Safranine Y Extra	CCC	Acetic Acid	Silk	v. s. m.
17	729	1%	Victoria Blue BX	DuP	Acetic Acid	Silk	=
18	737	2%	Wool Green S	G	Sulphuric Acid	Silk	s. m.
19	768	2%	Eosine Y	G	Acetic Acid	Silk	v. s. m.
20	79	2%	Scarlet 2RY	S	Sulphuric Acid	Silk	=
21	1054	1%	Alizarine Blue SAP New	G	Sulphuric Acid	Wool	=
22	—	2%	Erio Violet RL	GY	Sulphuric Acid	Wool	v. s. m.
23	138	0.2%	Metanil Yellow 1955	NAC	Sulphuric Acid	Wool	s. m.
24	—	0.5%	Erio Chrome Cyanine RC	GY	Top Chrome	Wool	v. s. m.
25	79	1%	Scarlet 2RY	S	Sulphuric Acid	Wool	v. s. m.
26	101	0.5%	Alizarine Brown B	CCC	Chrome Mordant	Wool	v. s. m.
27	—	—	Naphthol ASG, 12 grams per liter Fast Scarlet 2G Salt, 24 grams per liter	G	Ice	Cotton	=
28	1177	—	Indigo, Navy shade	DuP	Vat	Cotton	=
29	—	1%	Chlorantine Fast Green BL	SCI	Salt	Cotton	s. m.
30	326	2%	Pontamine Fast Orange S	DuP	Salt	Cotton	s. m.
31	—	0.5%	Solantine Brown R	NAC	Salt	Cotton	=
32	365	0.3%	Chrysophenine XXX Conc.	NCW	Salt	Cotton	=
33	518	2%	Direct Sky Blue 6B Conc.	NCW	Salt	Cotton	=
34	—	2%	Diazo Indigo Blue 4GL Extra, beta naphthol	G	Developed	Cotton	v. s. m.
35	394	2%	Pontamine Violet N	DuP	Acetic Acid	Silk	v. s. m.
36	1075	2%	Alizarine Astrol B	G	Acetic Acid	Silk	=
37	179	2%	Azo Rubine Extra	NAC	Sulphuric Acid	Silk	=
38	—	2%	Hemadol (Hematine)	JC	Iron Mordant	Silk	=
39	1217	0.5%	Helindone Orange R	G	Vat	Silk	=
40	—	—	Naphthol AS, 6 grams per liter Naphthanil Blue B Base, 1.5 grams per liter	DuP	Ice	Silk	=

* Abbreviations used for the manufacturers' names are as given in the Colour Index and in the 1930 Year Book of the American Association of Textile Chemists and Colorists.

** In this column = means equal fading, v. s. m. means very slightly more fading, and s. m. means slightly more fading of sample in set 112 (Corex-D glass exposure) than sample in set 113 (ordinary glass exposure).

V. RESULTS

The corresponding exposed samples of the two sets were compared by visual examination. The results of the comparison are indicated in Table 1 which shows how the fading of each sample in set 112 (Corex-D globe) compared with the fading of the corresponding sample in set 113 (ordinary glass globe). Many of the samples showed very slightly more fading in set 112. The differences were very small; so small that they would not be considered except in a critical comparison of the results. These are marked v.s.m. (very slightly more) in the table. A few of the samples showed somewhat greater differences in fading. These differences, however, were only a little larger than those mentioned above. They were not large enough in any case to lead to a difference in classification in ordinary fastness tests. The letters s.m.

(slightly more) are used in the table to designate such samples. Some of the samples showed no visible differences in fading in the two sets. These are marked = in the table.

TABLE 2.

SPECTRAL DISTRIBUTION OF THE RADIATION FROM ENCLOSED CARBON ARCS

Spectral Range	Per Cent of the Total Radiation With Ordinary Globe*	With Corex-D Globe**
279- 290 mμ	0.0	0.6
290- 320 mμ	0.0	3.4
320- 360 mμ	2.0	5.9
360- 480 mμ	18.5	15.3
480- 600 mμ	9.3	8.9
600- 1400 mμ	16.5	15.1
1400- 4200 mμ	22.1	21.3
4200-12000 mμ	31.6	29.5

* Measurements by W. W. Coblentz and R. Stair, Bureau of Standards.
** Data furnished by Atlas Electric Devices Co., Chicago, Ill., Manufacturers of the Fade-Ometer.

TABLE 3.

RECORD OF EXPOSURES

	Set 112				Set 113			
	Samples 1-20		Samples 21-40		Samples 1-20		Samples 21-40	
	First Half	Second Half	First Half	Second Half	First Half	Second Half	First Half	Second Half
Exposure Hours	20	40	40	80	20	40	40	80
Kilowatt Hours	54.6	108.6	108.6	214.9	53.4	107.3	107.3	213.8

VI. CONCLUSION

We conclude from the above that the use of a Corex-D globe instead of the usual glass globe in the Fade-Ometer will not materially affect the results of fastness tests.

[1]Publication approved by the Director of the National Bureau of Standards, U. S. Department of Commerce.
[2]Chairman of the Sub-Committee on Light Fastness of the Research Committee of the American Association of Textile Chemists and Colorists.
[3]Research Associate, American Association of Textile Chemists and Colorists.
[4]Dyeings similar to these, together with about 1,200 others, had been exposed previously under various conditions. Cady and Appel, Am. Dyestuff Reptr. **18**, pp. 407-446 (1929).
[5]Coblentz and Stair, B. S. Journ. Research **3**, 629-689 (1929).
[6]Coblentz, Dorcas and Hughes, B.S.Sci. Papers No. 539.
[7]Cunliffe and Lanigan, J. Textile Inst. **20**, T21-T30 (1929).

SEVENTY-FIFTH COUNCIL MEETING

The Seventy-fifth Council Meeting of the American Association of Textile Chemists and Colorists was held at the Engineers' Club, Boston, Mass., October 16th, 1931.

In the absence of President P. J. Wood the meeting was called to order at 2:10 P.M. by Vice-President William H. Cady.

The other members present were as follows:

Treasurer: H. R. Davies; Councillors: Hugh Christison, Ralph F. Culver, Wm. R. Moorhouse; Councillors ex-officio: Henry D. Grimes, Chairman, Northern New England Section; Prof. L. A. Olney, Chairman, Research Committee; Secretary: Alex. Morrison.

The records of the last meeting were read and approved.

The Secretary's balance sheet was read as follows and approved:

Secretary's Balance Sheet—October 15th, 1931

Cash on Hand May 13, 1931		$ 849.91
Receipts May 14 to October 14, inclusive:		
Applications—32 @ $5.00		160.00
Dues 3—1930 @ $5.00		15.00
Dues 1—1931 @ $4.90		4.90
Dues 32—1931 @ $5.00		160.00
Dues Corporate—2 @ $25.00		50.00
Year Book Sales—17 @ $3.00		51.00
Year Book Sales—1 @ $2.00		2.00
Year Book Sales—1 @ $2.94		2.94
Pins—4 @ $1.50		6.00
Silk Washing Standards—13 @ $1.00		13.00
Light Fastness Reports—7 @ 50c		3.50
Howes Publishing Co.—Reporters		30.75
Interest credited May 27		.43
		$1,349.43
Disbursements		
May 29—Exchange charge on 3 checks	$ .25	
July 29—Exchange charge	.25	
Sept. 30—Exchange charge	.25	
July 1 To Treasurer—Research Fund	136.00	
July 1 To Treasurer—General Fund	800.00	
Cash on Hand Andover National Bank	407.68	
Cash on Hand	5.00	
		$1,349.43

The Treasurer's report was read as follows and approved:

Treasurer's Report, Oct. 15, 1931

General Fund

Balance as reported May 14, 1931	$6,895.88	
Cash received since May 14, 1931	800.00	
	7,695.88	
Expenditures since May 14, 1931	2,057.42	
Balance		$5,638.46

Research Fund

Balance as reported May 14, 1931	$4,513.31	
Cash received since May 14, 1931	2,636.00	
	7,149.31	
Expenditures since May 14, 1931	3,583.25	
Balance		$3,566.06
Balance		$9,204.52

Checking Account—	
First National Bank	$1,523.31
Savings Account—	
First National Bank	7,681.21
Balance	$9,204.52

The following were elected to various classes of membership, those not having been published thirty days were elected subject to no objections to any being received by the secretary from any member:

Active:

Boyd, A. M.—12 Smyth St., Greenville, S. C. Dyer, Victor Monaghan Co., Greenville, S. C.

Byrod, Fred R.—1307 Susquehanna Ave., Sunbury, Pa. Print Foreman, Sunbury Converting Works, Sunbury, Pa.

Fansler, Thomas H.—Box 293, Lacon, Ill. Overseer of Finishing, Lacon Woolen Mills, Lacon, Ill.

Goodings, Alfred C.—31 Rathnally Ave., Toronto 5, Ont., Canada. Director, Textile Dept., Ontario Research Foundation, 47 Queen's Park, Toronto 5, Ont., Canada.

Goodyear, Norman S.—Ambassador Arms, Stamford, Conn. Director of Dye Manufacture, Dip-It, Inc., 45 Cedar St., Stamford, Conn.

Harvey, Ellery H.—618 W. Chicago Ave., Chicago, Ill. Chief Chemist, Montgomery Ward & Co., Chicago, Ill.

Kennette, LeRoy—Salesman, The Roessler & Hasslacher Chemical Co., Inc., New York.

Graham, Peter—Mt. Holly, N. C. Supt. Dyeing, Carolina Dyeing & Winding Co., Mt. Holly, N. C.

Lulek, Ralph N.—1405 Delaware Ave., Wilmington, Delaware. Research Chemist, c/o E. I. duPont de Nemours & Co., Jackson Laboratory, P. O. Box 525, Wilmington, Delaware.

Parker, Earl S.—Carleton Hotel, Sweetwater, Tenn. Dyer, Sweetwater Woolen Co., Sweetwater, Tenn.

Fickett, Elmer E.—162 Hovey St., Lowell, Mass. Asst. Prof. Lowell Textile Institute, Lowell, Mass.

Rood, Melville H.—12 Ottawa Rd., Arlington, Mass. Chemist, Arthur D. Little, Inc., 30 Charles River Rd., Cambridge, Mass.

Schmitt, Chas. H. A.—68 Holmes St., Braintree, Mass. Chemist, Sandoz Chemical Co., 36 Purchase St., Boston, Mass.

Spooner, Ray A.—Mt. Holly, N. C. Buyer, Carolina Dyeing & Winding Co., Mt. Holly, N. C.

Wuertz, A. J.—2710 Van Buren St., Wilmington, Del. Chemist, E. I. duPont de Nemours & Co., Jackson Laboratory, P. O. Box 525, Wilmington, Del.

Zell, P. C.—412 N. Laurel Ave., Charlotte, N. C. Technical Demonstrator, Nyanza Color & Chemical Co., New York.

Junior:

Anderson, Carlton T.—3300 Colonial Ave., Norfolk, Va. Student North Carolina State College, Raleigh, N. C.

Bridges, M. Curran—206 Frank St., Greenville, S. C. Asst. Colorist and Second Hand Color Shop, Piedmont Print Works, Taylor, S. C.

Grant, James N.—120 W. Morehead St., Charlotte, N. C. Laboratory, Calco Chemical Co., 822 W. Morehead St., Charlotte, N. C.

Horney, Robert L.—Laboratory Manager, Ciba Company, Inc., Box 933, Greenville, S. C.

McNair, A. G.—820 Selwyn Ave., Charlotte, N. C. Salesman, The Grasselli Chemical Co., Inc., P. O. Box 959, Charlotte, N. C.

Sampson, Clifford W.—307 West 79th St., Apt. 4A, New York, N. Y. Service Chemist, Tubize Chatillon Corp., 114 E. 32nd St., New York, N. Y.

Associate:

Harris, J. W.—Salesman, 1416 Johnston Bldg., Charlotte, N. C.

Scheiber, George F.—504 Poplar Apt., Charlotte, N. C. Branch Manager, Grasselli Chemical Co., P. O. Box 959, Charlotte, N. C.

Corporate:

United Aniline Co.—156 Pearl St., Boston, Mass. Louis Aronson, Representative.

The following were elected to the various classes of membership subject to their being approved by the full membership committee; and further subject to their being published thirty days and no objections to any being received by the secretary from any member:

Active:

Baumann, Herman, P.—1791 Ocean Parkway, Brooklyn, N. Y. Textile Chemist, General Dyestuff Corp., 230 Fifth Ave., New York, N. Y.

Divine, Robert E.—185 Larch Ave., Teaneck, N. J. Chemist, Associated Dyeing & Printing Co., Inc., Paterson, N. J.

Dushame, Fred A.—5 Summit Ave., Methuen, Mass. Supt. of Dyeing, Wood Worsted Mills, Lawrence, Mass.

Holden, W. J.—Benning Blvd., Columbus, Ga. Supt. Textile Mill, Meritas Mills, Columbus, Ga.

Maeckel, Emil O.—42 Luddington Ave., Clifton, N. J. Supt. of Dyeing, Forstmann & Huffmann Co., Garfield, N. J.

Metzner, Ernest H.—163 Clifton Ave., Clifton, N. J. Supt. of Dyeing, Forstmann & Huffmann Co., Passaic, N. J.

Mullner, Henry C.—79 Ackerman Ave., Clifton, N. J. Textile Colorist, E. I. duPont de Nemours & Co., Inc., Newport Div., Passaic, N. J.

Pierce, Clifton S.—62-64 Hoyt St., Brooklyn, N. Y. Director of Laboratory, Abraham & Straus, Inc., Brooklyn, N. Y.

Sokasits, Frank—63 Van Buren St., Passaic, N. J. Dyer, Forstmann & Huffmann Co., Passaic, N. J.

Wheeler, Harold L.—297 Morton Ave., Athens, Ga. Supt. Bleaching & Finishing, Oconee Mfg. Co., Whitehall, Ga.

Wilcox, Francis J.—Maple Ave., Warwick, R. I. Overseer of Dyeing, Greenwich Bleachery, E. Greenwich, R. I.

Junior:

Collingbourne, Jack H.—320 Watch St., Elgin, Ill. Collingbourne Mills, Inc., Bluff City Blvd., Elgin, Ill.

Field, Roddy A., Jr.—37 College St., Newnan, Ga. Asst. Supt., Newnan Cotton Mills, Newnan, Ga.

Larson, Thorwald—177 Eighth St., Providence, R. I. Research Chemist, U. S. Finishing Co., 389 Charles St., Providence, R. I.

Matthews, Raymond L.—298 Pawtucket St., Lowell, Mass. Student, Lowell Textile Institute, Lowell, Mass.

Associate:

Smith, Ralph B.—145 Spruce St., Bloomfield, N. J. Director, Dept. of Engineering, New Jersey Laundryowners Assoc., 1060 Broad St., Newark, N. J.

The Minutes of the First Meeting of the Inter Society Color Council, September 21, 1931, at which Dr. Walter M. Scott as our representative was present, was read and ordered placed on file.

Letters from Quaker Chemical Products Corp. of July 13 and 24 were called to Council's attention, but in view of the fact that it was too late to do anything in connection with the subject matter they were ordered placed on file without action.

The Secretary, Henry D. Grimes and Hugh Christison were appointed a committee to consider amendments to the Constitution to report at the next Council Meeting.

Wm. R. Moorhouse as a member of Annual Meeting Technical Program reported for his committee, outlining the program, which is practically complete and which promises to be an exceptionally good one.

Harry R. Davies as Chairman of the General Annual Meeting Committee of the Northern New England Section reported on the progress of his committee and promises a good time to all who attend.

A report from Charles B. Ordway of Auburn, Alabama, of the meeting held at Columbus, Ga., October 3, 1931 was presented. This was the second meeting held by a good representation of our members in that section of the South interested in having another local section in southern Georgia, Alabama, Mississippi, Louisiana and Texas. With this report of Mr. Ordway's was a list of members in that territory, twenty-five of whom were paid up, who were to be considered of this section. As a matter of fact the section has already organized, but not according to the regulations laid down by the Constitution. It was, however, voted that this list of names be considered an application and to approve the formation of such a section to be known as the Southeastern Section.

In order to make the application constitutional, the Secretary was instructed to prepare a formal application to be sent Mr. Ordway to be signed by at least 25 members in the territory to be included by the new section. It was also voted that Charles B. Ordway, the present Secretary of the section as organized, act as Secretary pro tem, and to go through the motions of the organization of the section as outlined in the Constitution.

In Mr. Ordway's report of the October 3rd meeting, he outlined the territory to be included in the new section. It was voted that Arthur R. Thompson, Jr., Chairman, Secretary of the Piedmont Section, J. D. Mosheim, Secretary of the South Central Section, and Mr. Ordway be appointed a committee to confer on the boundaries of the new section and to report back to the next Council Meeting.

E. A. Feimster, Jr., Chairman of the new section, and a Junior Member lacking a few months of age to become an Active Member, was granted Active Membership to enable him to retain the Chairmanship of the Section.

The meeting adjourned at 3:45 P.M. with tentative date for the next meeting set as November 6th in New York.

Respectfully submitted,

ALEX. MORRISON.

Secretary.

NOVEMBER MEETING, NORTHERN NEW ENGLAND SECTION

The Northern New England Section met in Riverbank Court Hotel, Cambridge, on Saturday evening, November 7. There were forty-two at dinner and about fifty at the meeting.

Professor E. B. Millard of the Massachusetts Institute of Technology spoke on "Some Applications of Physical Chemistry to Textile Research."

Harry R. Davies described the atractive program prepared by his committee for the Annual Meeting on December 4 and 5, and the obligations of the members of the Section individually as hosts.

The Section plans to hold meetings in Cambridge on the first Saturday evening of January, February, March and May, a meeting in vicinity of Lawrence on Friday, April 8, and the usual outing in June.

Respectfully submitted,

H. C. CHAPIN,

Secretary.

Proceedings of the American Association of Textile Chemists and Colorists

Report of Sub-Committee on Standard Methods of Determining Sizing and Finishing Materials in Textile Fabrics

By **RUSSELL W. HOOK**
Sub-Committee Chairman

TWO standard samples of sized textile material were sent to five cooperating laboratories* indicated as A, B, C, D and E, with the request that they analyze them in accordance with the tentative method published in the 1930 Year Book, pages 126 to 128.

Results have now been received from these laboratories and they are published herewith.

STANDARD SAMPLE FOR ANALYSIS, No. 1

Laboratories	A	B	C	D	E
Cloth	%	%	%	%	%
Dry Cotton	36.01	38.10	39.00	39.17	39.70
Natural Moisture	2.34	2.65	2.70	2.73	2.76
Size, etc.					
Excess Moisture	1.80	1.65	1.30	0.90	1.58
Oils, Fats, Waxes	0.45	0.42	2.50	0.46	0.73
Soap	0.27	0.24	2.00	0.34	0.00
Starches & Gums	20.27	17.78	16.60	17.55	20.32
Mineral Fillers	38.86	39.16	35.90	38.85	34.91
	100.00	100.00	100.00	100.00	100.00
Total Cloth	38.35	40.75	41.70	41.90	42.46
Total Sizing	61.65	59.25	58.30	58.10	57.54
	100.00	100.00	100.00	100.00	100.00

STANDARD SAMPLE FOR ANALYSIS, No. 2

Laboratories	A	B	C	D	E
Cloth	%	%	%	%	%
Dry Cotton	83.47	83.64	86.40	86.45	85.68
Natural Moisture	5.43	5.33	5.70	6.05	5.57
Size, etc.					
Excess Moisture	0.48	0.00	0.00	0.00	0.25
Oils, Fats, Waxes	0.70	0.57	0.40	0.75	0.54
Soap	0.56	1.15	1.90	0.61	0.00
Starches & Gums	9.36	9.31	5.60	6.14	7.96
Mineral Fillers	0.00	0.00	0.00	0.00	0.00
	100.00	100.00	100.00	100.00	100.00
Total Cloth	88.90	88.97	92.10	92.50	91.25
Total Sizing	11.10	11.03	7.90	7.50	8.75
	100.00	100.00	100.00	100.00	100.00

Hochstadter Laboratories, Inc., 227 Front Street, New York, N. Y.
Kendall Company, Walpole, Massachusetts.
Arthur D. Little, Inc., 30 Charles River Road, Cambridge, Mass.
Lowell Textile Institute, Lowell, Massachusetts.
Sayles Finishing Plants, Inc., Saylesville, Rhode Island.

APPLICANTS FOR MEMBERSHIP

Active

W. C. Brothers, Supt., Azo Color Dept., E. I. DuPont de Nemours Co., Deepwater Point, N. J. Sponsors: Charles A. Seibert and L. F. Ryan.

Auguste C. Philey, Boss Dyer, International Dye and Print Works, Paterson, N. J. Sponsors: Robt. H. Gaede and Frederick E. Otte.

Emil D. Altwegg, Boss Dyer and Bleacher, Century-Beverly Corp., Pottstown, Penna. Sponsors: Harry H. Johnson and Richard Robertson, Jr.

George W. Watson, Salesman, United Chemical Products Corp., Jersey City, N. J. Sponsors: E. A. Feimster and Charles B. Ordway.

Stuart J. Hayes, Chemist and Bacteriologist, Ludlow Mfg. Associates, Ludlow, Mass. Sponsors: Carl Z. Draves and Alex Morrison.

Joseph J. Grimiaux, General Manager, United Textile Print Works, Long Island, N. Y. Sponsors: C. F. Hoppe and W. B. Clough.

Herman P. Bauman, Textile Chemist, Gen. Dye Corp., 230 Fifth Ave., New York City. Sponsors: H. E. Hager and H. F. Herrmann.

Junior

Arthur E. Schneider, Chemist, Ludlow Mfg. Associates, Ludlow, Mass. Sponsors: Carl Z. Draves and Alex Morrison.

CALENDAR OF COMING EVENTS
ANNUAL MEETING—BOSTON, MASS., DEC. 4th and 5th. MEETING NORTHERN NEW ENGLAND SECTION, FIRST SATURDAY IN JANUARY.

Speakers for Annual Banquet to be Held Saturday Night, December 5th, at the Hotel Statler, Boston

DR. K. T. COMPTON, President of Massachusetts Institute of Technology.

BILL CUNNINGHAM, One of the leading sports writers and a special writer for the Boston Post. He will present a humorous resume of this year's foot ball games. Mr. Cunningham is a nationally recognized authority on this particular branch of sport.

HON. JAMES M. CURLEY, Mayor of Boston.

LAST NOTICE!!

Annual Meeting

of the

American Association of Textile Chemists and Colorists

Boston, Mass.

December 4th and 5th

Headquarters: Hotel Statler

AMERICAN DYESTUFF REPORTER

Devoted to the use and application of dyestuffs and the mechanical equipment incidental thereto.

LOUIS A. OLNEY
Professor of Chemistry and Dyeing, Lowell Textile Institute
Directing Editor

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Vol. XX November 23, 1931 No. 23

SURVEY OF TEXTILE RESEARCH

A SURVEY has recently been compiled by the United States Institute for Textile Research, Inc., for the Textile Foundation. The title of the survey is: "Survey of Textile Research in the United States." The report showed that 159 textile concerns or 14 per cent of the total number canvassed were conducting research. Another recent survey of research in 40 industries showed only 353 concerns, or 7 per cent of the total canvassed engaged in research. However the units of the textile industry are, as a rule, much smaller than those of other leading industries, and consequently the total amount expended for research was very much larger for the other industries. Many large units of the electrical, chemical, steel and automotive industries are spending as much as five to fifteen million dollars annually in research.

The purpose of the survey of textile research was to show the facilities available and the character and scope of research completed and in progress. It shows that facilities and skilled personnel available for textile research in commercial laboratories, educational institutions and government departments are considerably in excess of the present demand. It suggests that their utilization by the industry in cooperative research should precede any attempt to organize and finance a central group of laboratories, although cooperative research through the latter should be the ultimate research goal for an industry like the textile industry with more than 7000 individual units.

The method suggested by the survey to enable the manufacturers to benefit by the existing facilities is to finance graduate fellowships at textile and technical schools and other educational institutions, and to place associates at commercial and government laboratories. The method was strongly favored by the late Dr. Stratton, who was president of the Institute, it being his belief that research in industry would increase in proportion to the increase in the supply of trained researchers. The method proposed is a logical one. For a minimum expense a manufacturer can have the benefits of a skilled research worker who will have the proper equipment with which to work.

Further emphasis is placed by the survey on the lack and need of more fundamental textile knowledge, and scientific research with that point in view. This should result in providing a basis for future development work which will aid in producing new products to take care of the excess productive capacity of the industry. The need for a complete bibliography of world research in textiles is also noted. Such an index of research work would be of immense value in preventing duplication of effort.

It is also interesting to note that, although the facilities for chemical research are much greater than for physical research, 57 per cent of the research subjects reported were for physical tests, whereas only 31 per cent were chemical. The remainder were economic.

This survey is the first attempt to classify all textile research work in the United States and the results are well worth the effort.

RELIEF AND TRADE ASSOCIATIONS

ALTHOUGH trade associations are generally conceived as being established for the advancement and benefit of their own peculiar requirements, they have at the present a much more important place to fill in the economic structure of our country. That place is in the furthering and development of plans for unemployment relief. According to a statement by Eliot Wadsworth, chairman of the Committee on Cooperation with National Groups and Associations, one of the five committees of the President's Organization on Unemployment Relief, more than one hundred national trade associations, representing as many divisions of industry and commerce, are helping to line up their members in the national drive for local relief funds.

When one realizes how many branches of trade and industry are represented by trade associations, it can be readily seen why the Committee on Unemployment Relief should choose to function through these various associations. They are one of the most important means of contact with business firms in this country. Of course, a certain amount of dependance is placed upon individual businesses, but in a great many cases the key to the situation rests with the trade association.

Quoting Mr. Wadsworth: "In order to reach the thousands of separate units whose help is so essential in this emergency, we have turned to the national trade groups, and with generous response. More than one hundred trade associations are offering active support. What we have asked them to do is to write their members and their local units, urging them to join in unified action

to meet each local situation in which they can possibly help or be of influence.

"The thousands and tens of thousands of letters which trade associations are sending to responsible groups throughout the country and the action which is being taken by local or national trade meetings are bound to have an important effect in lining up American business behind the emergency unit. As well as aiding in the relief situations, many trade associations have been making a continuous effort to promote wise employment measures among their member firms."

At a recent meeting of the New York Section of the American Association of Textile Chemists and Colorists, the members were addressed by Mr. Philip Abee, a representative of the Emergency Unemployment Relief Committee. In commenting on this address, Vice-Chairman Henry F. Herrmann stated: "Gentlemen, it almost seems to be fate that all the signposts point in one direction—the request on the part of the Emergency Unemployment Relief Committee to have a representative come here and tell us about the hard times that others are suffering, and letters of this sort (referring to a letter from the American Home Economics Association) which clearly point the way out of difficulty and to prosperity.

"Some of you may ask 'What concern is this of ours?' Weren't we much happier in the olden days when we would all sit together and talk about whether it was better to add soda ash or trisodium ash to a bath, and whether such-and-such vat dye was really suitable for printing or not?

"I believe that recent developments have shown that our Association is being forced into a larger scope of activity than this. We are not only technical men, but we are a cross-section of the textile industry. . . .

"Just now times are so critical that I am strongly of the belief that we can well afford to leave our immediate technical problems and think a little business in general, of prosperity, and, above all, . . . of the ultimate consumer."

The ultimate consumer is, in many cases, one of the unemployed. A person who has things to sell is naturally more interested in someone who has the money to buy. But in times such as these the interest should be extended to those who, although unable to buy now, will be consumers when employment conditions enable them to be.

On the whole the American trade associations have progressed considerably within the last few years. Some have been forced to disband due to lack of support or inefficient organizations, but the majority have increased the scope of their work and flourished. It is to be expected that they should be called upon to aid in alleviating the distress of our present national crisis.

Dividends from Pennies

What do you get when you buy Christmas seals?

Most obviously, of course, you receive little pieces of paper which you stick on letters and packages during the holiday season, both as an expression of good-will toward humanity, and an example to induce others to buy them.

But there is something else you get which is shared by all—and that is improved community health, which, to get right to the point, means you have a greater chance to live a longer life.

Seals are sold to fight tuberculosis. This disease is still the arch-enemy of man, killing more people between the ages of 15 and 45 than any other ailment. Each year sees a falling death rate from this cause, and there is every reason to expect this record of success to continue in the future, if the pennies of the public do not fail in supporting the warfare against the scourge. But the battle has not yet been won by any means.

It is imperative to continue the work which the Christmas seal has been doing. Unknown tuberculosis cases must be ferretted out and placed under care in the early stages; children who already show evidence under the X-ray that they are candidates for active disease a few years hence must be found and safeguarded; summer camps and clinics in many places need support; public health nurses are required in others. These things and many others the Christmas seal penny helps to do. Foremost, perhaps of its achievements, is the campaign of general education which is ceaselessly waged to inform the public of the nature of the disease; how it spreads by contact from the sick to the well; how the sick must be discovered and the contact broken. Getting patients under treatment in sanatoria is important, but the greatest advance against the disease is along preventive lines. By raising the standard of popular knowledge people are enabled to protect themselves, advancing the arrival of the day when sanatorium care will be unnecessary.

Tuberculosis in the United States wipes out the equivalent of a medium-sized city every year. It has been estimated that to endure the disease as it now exists for the next twenty years would cost the nation more than twenty billion dollars. In the last twenty years education and sanitation have combined to cut the death-rate in two.

Will the public continue to give the pennies, the dimes and the dollars needed in the next twenty years to abolish tuberculosis, or will it allow tuberculosis to take from it twenty billions of dollars and hundreds of thousands of lives? That is the challenge which the nation answers every Christmas, when everybody, rich and poor, buys Christmas seals.

A Reminder: Annual Meeting of the American Association of Textile Chemists and Colorists—Boston, Mass., Dec. 4th-5th.

Design Patent Revisionists in the New Congress Will Offer Substitute for Design Copyright

By **WALDON FAWCETT**

IN AN interview for the AMERICAN DYESTUFF REPORTER, Senator C. C. Dill makes it clear that, if the 72nd Congress is to provide a different form of protection for original designs in industry, choice must be made between two agencies. The news is of unusual moment to the dyestuffs industry in that there is liable to be marked difference between the alternative mediums of protection in the degree of recognition accorded to color as an instrumentality of distinctive design. Furthermore, the selective course of Congress is bound to have influence upon the future policy of private institutions for design certification, notably the inter-textile clearing house established by the Design Protection Association.

Through all the later reaches of the movement to establish Design Copyright or Design Registration, there have been hints of a rising sentiment in Congress in favor of reconstruction of the present institution of Design Patent rather than complete abandonment of the patent structure for the new system. This movement dates back to the stage when the officials of the U. S. Patent Office replied to some of the criticisms which have been leveled at the design patent system. The Commissioner of Patents, testifying before a committee of Congress, emphasized particularly that the delays which once impeded the marketing of seasonal designs, no longer existed. Instead of a lapse, as charged, of, say eight months between date of application and issuance of a design patent, it was represented that design applications are, under favorable circumstances, cleared in three weeks or a month.

Senator Dill of the State of Washington has been the chief exponent in Congress of the theory that it would be a mistake to set up an entirely new system of design enrollment if the existing system may, by modification, be made to serve the need. When the Senate Committee on Patents was considering, last spring, the Vestal Bill to establish Design Copyright, as passed by the House of Representatives, Senator Dill stated to the Committee that he believed that the design patent system could be tinkered in such a way as to meet present objections and serve the needful purposes. Senator Dill did not, however, indicate whether he would personally take the initiative to retain Design Patent as the sole shelter for ornamental designs.

That the leading opponent of Design Copyright is now ready to commit himself to this course is indicated by his statement for the Reporter. He said: "I hope to introduce some sort of a revision of the Design Patent law, but I am not yet in a position to outline this in detail. In fact, I have done nothing about it this summer but hope to prepare it in the fall." At the same time, Senator Dill indicated that he will concentrate his attention on this species of "industrial property" protection and will not, as rumor had reported, attempt to secure acceptance of a corresponding policy with respect to the projected revision of the Federal trade mark laws.

Evidence that Senator Dill will have cooperation in the lower house of Congress is contained in a statement by Representative William I. Sirovich of the 14th New York Congressional District. Sirovich indicates that he expects to cooperate with Senator Dill. Meanwhile, the supporters of Design Copyright are not moved, by the prospect of opposition. In answer to inquiries for the Reporter, Representative Vestal states that he will re-introduce the Design Copyright Bill "at the beginning of the next session." He added: "I feel certain that this Bill, as well as the Trade Mark Bill and the General Copyright Bill will be passed at the next session." The General Copyright Bill, it may be added, is of interest to the color industries if for no other reason than that it transfers from the Patent Office to the U. S. Copyright Office, the jurisdiction over labels, advertising prints, etc.

Senator Felix Hebert, who was in charge of design protective legislation in the U. S. Senate at the last session, and will probably continue in that capacity in the next Congress, is likewise undisturbed by the opposition of the forces that pin faith to a rebuilt system of design patent. Commenting for the AMERICAN DYESTUFF REPORTER, Senator Hebert said: "I have reason to believe that if there had been a little more time available during the last session of Congress the Design Copyright Bill would have been enacted into law. What the fate of this measure will be in the forthcoming session I am unable to predict. I known there is a favorable sentiment for it and while there are some features of the Bill to which there is objection, yet I believe a majority of both houses would vote for its passage."

With the League for the Suppression of Design Piracy, and various organizations within the textile industries, already planning the most intensive drive yet arranged in behalf of Design Copyright it is worthy of passing comment that the sentiment for retention of Design Patent is not wholly confined to Senator Dill's bloc in Congress. A group of patent lawyers, including specialists prominent in their branch of the profession, have launched a campaign of propaganda in favor of continued dependence

upon Design Patent, instead of the looser form of certification which would accomplish quick enrollment but would leave it to design claimants to settle in the courts all details of their quarrels over priority of design adoption and use.

Among the authorities on design protection who lean to the idea of patching up the present law, is Mr. William D. Shoemaker. Stating recently his position, he said: "I realize that by and large the inventors of designs are not adequately protected at the present time, but I maintain that the fault does not lie with the law as it is worded but rather with the administration of the law. I cannot follow the proponents of the changes suggested in the Design Copyright Bill because I believe that these changes are entirely too radical to accord any immediate beneficial results to designers and because I believe that some very simple changes in the administration of the law, with

The loyalists who are lining up in defense of revised Patent on Design in place of the proposed Design Copyright are stressing one argument that may be of exceptional interest to the color industries. They emphasize the fact that during the last ninety years there has developed around the subject of design patents a mass of precedents that is of the utmost importance for the guidance of designers and design-owners. The work of making these precedents is estimated in terms of hundreds of thousands of dollars. Outstanding among the "controlling" rulings are the precedents which, point by point, have cumulatively prescribed the status of color as an element in patentable design. It is urged that a background of precedent is necessary to the administration of any system of design protection and that in the event of a shift from Design Patent to Design Copyright, uncertainty would reign while a new muster of precedents was in the making.

One effect of the recourse of the dissenters in Congress to the Design Patent alternative will be to free the Congressional supporters of Design Copyright of any obligation to resubmit last year's version of Design Copyright, Limited. It may be recalled that, in a desperate effort at compromise, the Senate Committee last spring reported out a mutilated Design Copyright Bill which was to be applicable to only five selected commodity lines, including textiles. This make-shift measure would have excluded some of the major color-using lines, as, for example, the wall paper industry. With compromise, in effect, rejected, by the conservatives who elect to stand or fall by Design Patent, the supporters of Design Copyright will reintroduce the Design Copyright Bill in its original form applicable to all original designs applied to or expressed in articles of manufacture.

It will be well worth your while to attend the Annual Meeting of the AATC & C., Boston, Mass., December 4th and 5th.

The Effect on Wool of Temperature and Hydrogen Ion Concentration of the Scouring Bath

(Continued from page 746)

washed in solutions having pH values ranging from 9.5 to 10.5 + (the pH value of the pure soap solution being 9.5). The "burnt" wool group were those which were washed at 70° C. in solutions having pH values greater than 10.5, and two units washed at 50° C. for 5 and 7 minutes respectively in solutions having pH values of 12.0. The examination of all units shows that the temperature of 50° C. is the best for scouring baths and the pH values of the solutions may range from 9.5 to 11.0 before burning of the wool takes place.

Conclusions

The conclusions are as follows:

1. The immersion of wool in distilled water of various temperatures, and for various time periods does not effect the tensile strength of the wool after the wool is redried.

2. For baths of the same temperature, the tensile strength of wool is decreased by immersion in baths of pH values greater than 4.8, although the amount is practically zero until the pH value becomes greater than 7.0. The loss in tensile strength from this pH value upward slowly increases, the rate of loss becoming greater until the last 50 to 75% of the tensile strength disappears within an increase of 1 in pH value.

3. As the temperatures of the baths having the same pH values was increased, it was found that the average rate of decrease in tensile strength doubled for every 13 to 14° C. rise in temperature.

4. On investigating the effect of time, it was found that for short time periods, the rate of decrease in the tensile strength was very rapid, and slowing up as the time period increased.

5. It was found that decoloration is also a function of the pH value of the bath solution. The decoloration is very small and not noticeable to the eye for most pH values between 7 and 9.5. Above the latter pH for long time periods, the amount of decoloration increases more rapidly until it becomes a maximum.

6. The temperature of 50° C. appeared to give the maximum pH range for clean wool when the time period was approximately 4 to 5 minutes.

Ed. Note.—The references noted in the body of this article will appear in the next issue.

Polish Output of Coal-Tar Products, Second Quarter, 1931

According to Assistant Trade Commissioner Gilbert Redfern, Warsaw, coal-tar crudes from 9 Upper Silesian coke plants, and coal-tar distillates produced in Poland during the first two quarters of 1931 were as follows (in metric tons):

Dyeing Vat Colors on Piece-Goods*

By W. WILLIAMS

THE vat dyestuffs belonging as they do to the fastest group of coloring matters known, and yet giving such remarkably bright and pure shades, are naturally in ever-increasing demand. The extreme fastness of the colors on the fiber is due to their insolubility in water, the dyeing being done with the reduced or leuco compounds, the finishing process being oxidation to their former insoluble state. Owing to their method of application these colors are the most difficult the dyer has to use, for apart from the care required to keep the colors well reduced, his difficulty is to judge the shade of the batch and make shading additions. Once the goods are oxidized, should they not be of the shade desired, a further reduction in the shading bath may quite conceivably take off more color than the shading process put on, and the dyer's main hope should be to get the shade "up" the first time, which can only be done by a rigid adherence to proved successful methods of dyeing, in which direction it is hoped these notes will help.

It is well known that the levelness, penetration and to some extent the permanency of dyed shades is largely dependent on a thorough wetting-out of the cloth, and in vat dyeing the use of a wetting-out agent stable in alkali, such as Perminal (I.C.I.), is of extra importance, as by its use the surface tension of the dyebath is reduced, thus causing the oxydized dyestuff to sink and become reduced again, and keeping the bath as free as possible from a scum of oxydized dyestuff, which is always liable to mark off on to the goods running through it.

After the goods have been run on to the machine through the wetting-out liquor at the same temperature as the dyeing is to be carried out, they should be given two ends in a caustic soda and hydrosulphite solution to reduce any possibility of air spots remaining in the goods, thereby oxidizing color during dyeing and causing the finished pieces to show dark markings. From this stage in the dyeing to the completion of oxidation the batch should be kept constantly in motion, as with any stoppage the resultant draining will cause uneven dyeings by the formation of "bars" of darker shade.

The colors are reduced to their leuco state with caustic soda and hydrosulphite by amounts and at temperatures advised by the particular makers of the colors used. To get the best results in shade, fastness and exhaustion these instructions must be followed, and as vat colors are roughly divided into two classes, hot dyeing and cold dyeing, the dyer in selecting combinations to give a particular shade must exercise care not to select colors with opposing methods of application if it can be avoided. The cold dyeing colors as a class are far more soluble and therefore increasingly difficult of exhaustion, and as in vat dyeing the caustic soda has a great deal of control over color exhaustion—being similar in action to salt with a direct color—the amount of caustic soda used to dissolve the cold dyeing colors is generally cut down to one-half of that used with hot dyeing colors. With both classes, pale shades are given less caustic soda than medium and heavy shades to facilitate exhaustion, although as the hydrosulphite is acid in action excess caustic soda must always be present, just as sufficient hydrosulphite must always be present to ensure the color being kept in a thoroughly reduced state. If the color comes out of solution in a run, the result is invariably fatal.

These methods of application of the cold and hot dyeing vat colors may be manipulated to ensure particular results. For instance, to prevent too rapid exhaustion of pale shades in the hot dyeing group (120° F.), the amount of liquor can be increased slightly and the temperature lowered to 80° F. Dyeings carried out this way will be slowed down sufficiently to prevent quick exhaustion and probable "ending" of the batch. Similarly, cold dyeing colors may be dyed at 120° F. where the type of cloth demands extra penetration. Dyeings done by this method for this purpose fully justify the amount of color value which, of course, has to be sacrificed.

The colors generally reach the dyer in paste form, and while there are a few colors which must be vatted in the jig the great majority can be prepared for use by reducing them in a "stock vat" in a greater concentration. While this method of preparation is generally referred to as a stock vat, the colors cannot be kept in this reduced form for any length of time, and it is most advisable to reduce only sufficient color for immediate use. The requisite quantity of color required is bulked a little with warm water and sieved through a cloth into a keg or suitable crock. The temperature at which reduction is advised by the color maker is then obtained by the addition of further water, and the necessary amount of caustic soda and hydrosulphite added. The stock vat should be allowed to stand a little until thorough reduction is effected; it may then be added to the jig which already contains an amount of caustic soda and hydrosulphite.

The height of the water in the jig for the actual dyeing operation is largely controlled by the size of the batch

* Textile Recorder.

and the shade strength required, but it is always advisable if possible to have the dye liquor reach the top rollers in the jig. Dyeing under such circumstances is carried out with the minimum of liquor disturbance, with a consequent great reduction in the amount of air carried into the liquor, which always involves a danger of precipitating the bath by air oxidation. The final pieces of a large batch, if run through a low liquor, will cause a deal of agitation, and the formation of oxydized dyestuff as scum always carries the danger of marking the pieces.

Rubber nip rollers should not be used on the pieces during dyeing as the lists are more perfectly squeezed than the body of the pieces. Thus, in batching on the roller the lists become much drier than the remainder of the pieces, with consequent oxidation, and as a result they pick up more color in the succeeding run to give a final batch with very dark selvedges.

Uneven width in a batch to be dyed is a common cause of dark selvedges, the overlapping portions becoming oxidized through greater exposure to the air and so picking up relatively more color in the succeeding run.

No vat dyes during the dyeing process show a shade in any way resembling their true oxidized color, so the dyer must have his "bit" oxidized and soaped before he can judge how the batch is shaping to the required shade. It is a good plan to "bit" the batch during the fourth end, keeping the rollers in motion by hand oscillation while the "bit" is being removed; this is best done at the first seam so that there is a chance of the pattern being judged before the end has finished running. In actual practice the sample taken from the batch and oxidized separately is slightly different to the shade of the batch on completion; but the dyer is expected to know what the extent of the difference will be, and he can only make certain his pattern is oxidized in a manner as closely as possible relative to the subsequent oxidation of the batch, and above all to see that the pattern has been well washed and no additional shading has been added, such as greenness due to bichrome not washed out from the oxidation. The dyeing is usually planned so that the operation is complete in six ends, and therefore a pattern from the fourth end should show a little under the depth finally required.

Any further additions of color must have their complement of hydrosulphite powder and caustic soda, as a certain amount of the original hydrosulphite is bound to be destroyed by oxidation.

In cotton piece dyeing the addition of salt to the jig to procure exhaustion is best avoided with the vat colors. The vat colors, however, do not exhaust completely, and with heavy shades it is a good plan to oxidize the batch in a separate jig and feed up the dyebath to dye the next lot of pieces. In this way a certain amount of color may be saved, but the practice is hardly worth following out in lighter shades as the color saved may not pay for the increased uncertainty of obtaining the desired shade in the succeeding batch.

After dyeing, an end through cold water is advisable; it washes away any scum on the pieces, does not wash off any appreciable amount of the leuco compound, and cools the batch down for the oxidation process, should the dyeing have been carried out hot.

Piece-goods may be oxidized by running through sours (hydrochloric acid) and bichrome of potash or soda. This method of oxidation is quite safe for ecrus, browns, reds and violets, but should not be used for any of the vat blues as it is then too severe in action, giving flat green shades of blue. Blues are best oxidized with perborate of soda at 120° F., a little acetic acid being added to neutralize caustic soda present from the dyeing. Goods oxidized with perborate of soda may go straight into the soaping bath, but where bichrome and sours have been used an end should first be given in water before soaping.

A thorough treatment in boiling soap solution is most essential if the full development of fastness of the shade is to be secured. The action of the soaping alters the shade further from that obtained immediately after oxidation, blues for instances, turning redder in tone. For the full development of the colors the soaping must be carried out boiling, and in this connection it is well to remember it is exceedingly difficult to obtain a temperature of 100° C. in an open dyeing jig under atmospheric pressure. Where bichrome and sours have been used as oxidants, soda ash is added to the soap bath, and boiling soda ash has a greening effect on certain brown shades. The ash is necessary to neutralize any hydrochloric acid left in from the oxidizing. A suitable strength of soaping bath is about 3 lbs. of soap and 1 lb. of soda ash to each 100 gals.

To obtain the full effect of the treatment with soap, the operation must be carried out boiling. When the goods are submitted to the action of actually boiling soap, the full development in shade and fastness takes very little time, but any amount of treatment at temperatures under the boil will fail to completely develop the color. A dyer can soon see if he is obtaining maximum benefits from his soaping bath by taking a pattern from a soaped batch and dropping it into a panful of the soaping liquor, and boiling on a gas jet for a few seconds. On drying there is sometimes a surprising difference between the pattern and the actual batch.

Should the vat dyer have to redye a batch through unevenness, color spots, or because the goods are not quite the shade required, he is immediately confronted with a big difficulty; the fact that it is not possible to strip vat colors from the fiber where the goods are run on jigs. A run through boiling caustic soda and hydrosulphite will remove a moderate amount of the color, and this process is often quite successful with unevenness and where shades have been slightly overdyed in strength. The only satisfactory way is to dye first the light shades of the order and leave the heavy shades absolutely to the last, so that if necessary any rejected pieces may be substituted for whites in the dyeing of the dark shades.

Olein and Wool Textiles*

By H. STADLINGER

Until about twenty years ago "olein" was always understood to be that mixture of filtered fatty acids which was obtained in the stearin industry after the saponification of tallow or bone fat, or by distillation after saponification. This mode of production dates back to the French patent of 1825 taken out by Chevreul and Gay-Lussac for the separation of fatty acids and the manufacture of candles therefrom. In 1829 Lefevre deduced on theoretical grounds the saponification by means of sulphuric acid, while in 1833 Milly and Motard gave the greatest impetus to the stearin industry by their introduction of the process of saponifying with lime under pressure. In 1842 Jones and Wilson took out their patent for a combined process of saponification with sulphuric acid and subsequent distillation of the fatty acids.

OLEIN was cradled in the candle industry. An olein of the highest quality is even today ordered under the name of "candle olein." Characteristic of the candle industry of those days was the fact that the important operation was the production of a stearin suitable for making candles, while the olein was a by-product which was absorbed mainly by the soap manufacturers for the production of olein soft soaps and soap powders. The needs of the textile industry were a secondary consideration. By 1910 the growing use of electric light, together with the increasing competition of paraffin wax and ceresin, had already begun to diminish the market for stearin. A part of the cost of its production had to be borne by the olein, and this, too, had to be sold at a profitable figure. The textile industry indicated a willingness to accept this enhanced price, provided that it was accompanied by a corresponding improvement in quality. The wool and shoddy spinners were particularly insistent in their demands for an olein carefully freed from all stearin, involving no risk of spontaneous combusion. The good prices obtainable for this class of textile olein gradually gave rise to a competition from superficially similar products, the chemical and physical properties of which, however, had very little in common with those of the normal candle olein. The market became flooded with mixtures of liquid fatty acids of vegetable origin, and even of oleins let down with mineral oils, and the selling price of genuine olein suffered a considerable drop. The serious competitors were those products from which had been carefully removed, or made innocuous, deleterious ingredients, such as bodies of evil odor, and highly unsaturated fatty acids. A good example of such a product was the Persapolin which was prepared from fish-oil by a special process of deodorizing and polymerization (Stiepel. D.R.P. 305,702 and 317,448). In fact, it is now possible to prepare oleins of excellent technical quality from the cheapest of raw materials, which are quite equal both in their analytical figures and in their technical behavior to the best grades of candle olein.

It has thus become essential to the manufacturer, the merchant, the consumer, and to the scientist, to evolve a definite specification as to what may be sold under the name of "olein"; furthermore, to decide on what shall be meant by soap olein, textile olein, candle olein, etc. It will, obviously, be very difficult for the interested parties to come to a unanimous decision on these points. The candle-maker will naturally demand that tallow and bone fat must be the only raw materials for the manufacture of "olein." Against that the makers of oleins of vegetable origin will ask for the inclusion of all vegetable oils, such as rape oil, arachis oil, and others the liquid fatty acids of which bear a close resemblance to olein. The synthetic chemist will likewise demand the inclusion of paraffin as a raw material, inasmuch as, by the oxidation of hydrocarbons, he is in a position to produce liquid fatty acids of an olein-like character.

Actually, it is clearly impossible to specify the raw materials that may be used for the purpose. One need only cite the remarkable progress made in the hydrogenization of oils, by means of which it is now feasible to convert a foul-smelling whale oil mixed with other fats into a well-flavored fatty comestible. Thus, the only course left open is to lay down the properties that an "olein," no matter what its origin, must possess. The starting point of such a standard specification must obviously be the characteristics shown by a high-grade candle olein. These are—

(*a*) Highest possible degree of saponification: not below 85%.
(*b*) Iodine value between 70 and 80.
(*c*) Solubility in ether (total fatty matters) at least 98%.
(*d*) Saponification value between 190 and 205.
(*e*) Good fluidity at 25° C.
(*f*) Absence of fishy or other unpleasant odors.

For an olein for textile purposes these specifications must be still further circumscribed. Above all, the point must be settled as to the proportions permissible of un-

* Melliand Textilberichte, 1931, 458.

saturated fatty acids, such as linoleic acid $CH_3.(CH_2)_4.CH:CH.CH_2.CH:CH.(CH_2)_7.COOH$, or linolenic acid $C_{18}H_{30}O_2$, with its three unsaturated linkages. Up to a few years ago the presence of such bodies was deemed impossible. It was accepted that a properly made candle olein would contain mainly oleic acid, a fatty acid with but one unsaturated linkage, together with a small proportion of stearic acid, and a little unsaponifiable matter, neutral fats, and lactones. The recent work by Kaufmann has, however, destroyed this conception. For he has shown that not only candle olein, but also its raw material—bone fat and tallow,—contains a considerable amount of linoleic acid, doubtless derived from the fatty ingredients of the food on which the cattle have been fed. Continued feeding with linseed or cottonseed cake, both of which are rich in unsaturated fatty esters, has doubtless been of influence here. Kaufmann has shown that bone fat may contain up to 5% and more of linoleic acid, while he has found up to twice this amount in pure candle olein ("Ztschr. f. angew. Chemie," 1928, 19; and "Allg. Oel und Fett-Ztg.," 1930, 4). As judged by the hexabromide test, linolenic acid, with its three unsaturated linkages, appears to be absent in a normal olein. Hence it must be concluded that the presence or absence of unsaturated fatty acids can no longer be taken as a criterion of the freedom of an olein from the danger of spontaneous combustion. This fact does not prevent the laying down of limiting values, based on the difference between iodine and sulphocyanide figures. Oleic acid, the most valuable constituent of a textile olein, gives figures, for both determinations, of 89.9. So that one may say that the more closely the iodine and sulphocyanide values approximate to the theoretical figure, the lower is the percentage of the more highly unsaturated fatty acids. This means lower fire risk and a higher value as a textile oil. For a preliminary investigation the Mackey test still maintains its value, provided that care is given to the calibration of the instrument, and attention paid to ensuring the absence of catalysts or moisture in the sample to be tested, since these impurities are liable to give rise to erroneous readings. In the author's opinion, the temperature readings, taken at five-minute intervals, should always be plotted out into a curve; and the temperature should never be allowed to rise above 103° C.

The case of those textile oils must also be considered which are made to pass the Mackey test by the addition of beta-naphthol or other retarding agents, but which show an unduly high iodine value. Opinions are still divided on this point. Oleins with an iodine value of over 90 must be regarded with suspicion. The question also arises as to how long such stabilized oils will retain their resistivity. As far as present information goes, the protective effect of the beta-naphthol appears to break down after a certain while. Such a product can only be labelled as worse than useless.

The resistance to the effect of low temperatures on textile oleins is another matter open to debate. The specification laid down above states that the olein should be liquid at 25° C., but that gives no information as to the effect of cold, although this property is of the greatest importance to the woolen manufacturer. He requires considerable fluidity at low temperatures, to enable the olein to soak well into the interior of the fibers, in spite of a certain amount of separated stearin. This means that the solidifying point of a satisfactory textile olein should lie below 10° C. Such a quality is particularly essential in those primitive establishments where rags are still impregnated out of an ordinary watering-can. The cold test may be standardized by demanding that an olein should remain clear after being kept at 10° C. for one hour. If the sample contains water, this must first be removed by heating to 105° C. and stirring, after which it is allowed to cool for half an hour to room temperature. The test should be carried out in a suitably sized test-tube fitted with a Beckmann thermometer graduated in half-degrees from — 30° C. to + 30° C. The test-tube is filled to a predetermined height with the oil, and then held by a clamp in a cooling bath. The duration of the test is taken from the time when the thermometer has fallen to 10° C. At intervals of ten minutes the cork is lifted and the sample gently stirred with the thermometer. This agitation is essential to prevent supercooling. Some olein manufacturers may consider this specification too stringent, in which case the wording may be altered to "must remain clear for one hour at 15° C." Just as in the case of neatsfoot oil, brands are sold with varying degrees of stability to cooling. Particular attention must be paid to the permissible percentage of unsaponifiable hydrocarbons. It is known that the distilled oleins contain a higher percentage of these than the saponification oleins. This is due to the formation of hydrocarbons during distillation. The condition of a maximum of 3% for saponification oleins and 5% for distilled oleins should be easily capable of fulfilment by the manufacturer. A higher percentage of unsaponifiable matter will not only unfavorably affect the emulsifiability, but will also introduce difficulties in the later washing-out of the olein with soap and soda. An excess of neutral fats will give rise to similar difficulties during washing. In distilled oleins, of course, there is very little neutral fat, but saponification oleins may contain considerable quantities. Hence the requirement of at least 85% saponified. It should be noted here that the difference between acid value and saponification value may be caused not only by neutral fats, but may also be due to the presence of lactones. Finally, a word should be said as to the presence of catalysts, since the presence of much iron, nickel, etc., may give rise in the case of oleins with more than one unsaturated linkage to a considerable degree of spontaneous inflammability. To remove these bodies the manufacturer frequently makes use of an extraction process involving treatment with sulphuric acid; but it is obvious that such a treatment may easily enable the olein to become "poisoned" again if stored for long in iron drums. It is very desirable that further research should be conducted on the possible activation of a normal olein by means of iron

when it contains some 8% to 10% of linoleic acid. As a temporary standard it might be laid down that a textile oil should not be allowed to contain more than 0.08% of mineral matter, of which not more than one-half should consist of iron oxide. The question, "What is olein?" is obviously more complicated than would appear at first sight, and the Olein Committee of the Wissenschaftliche Zentralstelle fur Oel und Fettforschung has set itself the task of clearing up these and kindred matters, with special attention to the details of analytical methods. A clear definition of "olein," "soap olein," "textile olein," and similar bodies would possess the following advantages:—

1. Products of doubtful composition would in future not come on to the market as olein, soap olein, or textile olein. This would give protection to the genuine olein industry.
2. The consumer can guard himself against the purchase of low-grade materials.
3. The terms "olein," "soap olein," or "textile olein" should be applicable to all such bodies as give the same analytical figures and show the same technical qualities as the normal article, irrespective of the raw materials from which they may have been prepared.

The Tannin Discharge Style in Calico Printing*

For the production of white or colored designs with a background of basic color there is even today no style of printing which can surpass in beauty and richness the effects obtainable by this method. The Tannin Discharge style was first introduced by Koechlin Brothers, of Muhlhaus, in 1887.

CLOTH which has been prepared with tannic acid and an antimony salt after the usual manner employed for the dyeing of basic colors, after drying is printed with the following mixture:

	Grams
Caustic soda 77° Tw.....	65
Brown dextrin	30
Potassium sulphite 30° Tw..	5

The British gum is carefully stirred dry into the caustic soda, taking great care to avoid the formation of lumps, after which the sulphite liquor is added. In some printworks china-clay is added to the above in order to give sharper impressions. The function of the potassium sulphite is to protect the tannic acid from conversion into brown oxidation products while in contact with air and alkali. Having been quickly dried, the printed goods are steamed for about one minute in a Mather-Platt with steam as dry as possible, or dried on a very hot cylinder, then taken through 1° Tw. cold sulphuric acid and well washed. The goods are then immediately dyed in a jigger by entering into the cold dye liquor, gradually bringing it to the boil in the course of an hour, and then dyeing close to the boil for another ¼ to ½ hour. In order to obtain a good white it is advisable to add to the dyebath about 1 gal. of a 10% glue solution per 100 lb. of cloth, and about 1½ oz. of tartar emetic per 10 gals. of liquor, particular care being taken that not more dyestuff is added to the dyebath than can be readily absorbed by the goods. Deeper shades may be obtained by a previous heavier mordanting of the goods: the white may be further improved if necessary by padding the dyed goods in a 1/10° Tw. solution of chemic, and drying immediately without washing off.

There are many difficulties inherent in the application of this process on the commercial scale. If the dextrin contains too much unconverted starch, the paste will be liable to become gradually gelatinous and unusable, owing to the slow swelling of the starch granules under the prolonged action of the caustic soda. The highly concentrated caustic-soda mixture appears to exert some kind of disintegrating action on the surface of the copper rollers and on the doctor edge. Thin irregular layers of alkali are thus enabled to pass forward on to the cloth, giving rise to doctor streaks which are invisible until the cloth comes to be dyed up after printing, when the damage is irreparable. This damage may be avoided, however, by the addition of a strong sighting color, which can be readily destroyed. Ultramarine is very suitable, being completely decolorized by the sulphuric-acid bath which the cloth receives after printing and drying.

Owing to the highly hygroscopic nature of the alkaline print paste, the designs are extremely liable to develop haloes through the absorption of moisture during steaming, and it is found to be very difficult to keep the prints dry enough either before or after steaming to prevent marking off. A relatively large amount of caustic soda penetrates to the back grey, and even to the woolen

* Textile Manufacturer.

printing blanket, with very deleterious effects. Theoretically, vat colors could be added to the printing paste so as to give colored discharges of great fastness. Unfortunately, with many vat colors the leuco compound formed during the steaming is rendered insoluble by the high proportion of alkali present, and the color yield is in consequence seriously diminished. Recent researches have shown that the proportion of caustic recommended in the original Koechlin recipe can be reduced to some extent if glucose, tartar acid, or ethyl tartrate is added. But the maximum reduction permissible is not more than 10%, which is of no practical importance as regards the essential difficulties of the process. Doctor streaks and haloes can be minimized to some extent by padding the cloth, before printing, with a 2% solution of ammonium chloride, which will be capable of neutralizing small amounts of caustic soda wandering out of their proper location. A German patent of 1911 proposed to replace the normal method of padding in tannic acid, allowing to lie, and then fixing in tartar emetic as a prepare, by padding the cloth in a solution of tannic acid, an antimony salt, and sufficient oxalic acid to keep the antimony tannate in solution. After drying, the cloth is printed, and immediately washed off in water only. The excess of oxalic acid present was reckoned to prevent any danger of doctor streaks and haloes, while there was no need for the usual souring and prolonged washing.

In "Mel. Text. Ber.," 1931, 403, Schneevoigt discusses the inherent difficulties of the tannin discharge process, and suggests that what is wanted is a print paste that will act as a reserve resist, not only decomposing the tannin and antimony mordant on the cloth, but capable of withstanding the steaming process and subsequent washing, so that it can act as a protection to the printed areas during the dyeing operation, preserving them from any contact with the dye-liquor, and thus ensuring a white of the greatest possible degree of purity.

The ingredients of such an ideal print paste must be in the first place soluble in the other constituents, and with no tendency to gradual premature precipitation before printing. The precipitate, when it does form, must be insoluble in the dilute acid of the dyebath, white capable of being readily removable in the subsequent soap bath. Since it may have to be used along with vat dyes and rongalite where a colored discharge is being printed, it must not possess any properties of an oxidizing character.

In a preparation of the I.G., "Cellapret," the writer of the paper referred to above claims to have discovered a substance which meets all the requirements of the case. Cellapret has the property of reacting with aluminate of soda at the high temperature of the steamer, to give an almost insoluble aluminum compound which is not acted on by dilute acetic acid. A print paste containing Cellapret and sodium aluminate keeps quite satisfactorily, and the proportion of caustic soda demanded by the ordinary discharge method can be very considerably reduced, while the place of any additional thickener is taken by using the Cellapret itself as a thickener. The discharge paste is to be compounded as follows:—

Cellapret solution 30%	680 grms.
Sodium aluminate	120 grms.
Caustic soda 90° Tw.	150 to 200 grms.

The goods are printed, dried, steamed from 3 to 5 mins., soured in dilute acid, dyed, and soaped without any necessity for after-chemicking. For there is absolutely no staining of the whites, since the proportion of caustic soda present is quite sufficient to destroy completely the mordant of tannin and antimony, while the precipitate of the Cellapret and aluminum compound completely protects the printed portions from any contact with the dye-liquor. An additional advantage shown by the Cellapret discharge paste is that owing to the much lower percentage of caustic soda present there is not the same tendency for the precipitation of the leuco vat dyes, so that the printing of colored vat discharges becomes at last a feasible proposition. The print paste recommended for this purpose contains—

Vat-dye paste	100 grms.
Cellapret 30%	510 grms.
Sodium aluminate	100 grms.
Caustic soda 90° Tw	150 grms.
Rongalite	90 grms.
Triethanolamine	50 grms.

Thus, while the use of Cellapret very largely overcomes the usual difficulties of the caustic discharge process, it is hardly to be expected that the process will at once return to the high demand that there was for it at one time. The basic colors are too fugitive in any case to be able to satisfy the modern requirements for fastness. But it will enable the printer to obtain better results with a greater facility, where the brightness and depth called for by the pattern makes the use of basic colors an unavoidable necessity.

NOPCO Changes

George M. Cunningham has been named by the National Oil Products Company of Harrison, N. J., to represent that company in the St. Louis district. Mr. Cunningham received his degree at Princeton and later took post graduate courses at Harvard and Massachusetts Institute of Technology. He joined the Nopco staff last April.

C. Albert Mugford, formerly a member of the sales force working from the Harrison, N. J., office, has been named sales representative for the Albany district. Mr. Mugford is a graduate of Boston University.

Instructive Talk

Mr. Basser Wooley of the Seydel-Wooley Company, Atlanta, Georgia, gave a very instructive talk to the Clemson Textile students on November 3. His subject was "Sizing Compounds and Their Application." He discussed a number of practical problems in slashing and weaving and discussed how these are being overcome by a number of mills.

Technical Notes from Foreign Sources

Dissolving of Dyestuffs in Powder Form

Lea-Faerber-Ztg. 67, 550 (1931).—Most dyestuffs which are to be dissolved in making up a bath dissolve easily and cause no trouble. Some, however, show a strong tendency to form pasty lumps or slimes, which dissolve slowly and incompletely, even though the dyestuff is perfectly and easily soluble when finally in solution. (The same trouble is often encountered in dyestuff synthesis, when H-acid, for example, is to be dissolved in a sodium carbonate solution.) Such dyestuffs, which are to be used in a bath containing common or Glauber salt, are either pasted up by slow mixing and steady stirring with successive small amounts of water, until a smooth, uniform paste is formed, which on addition to the bath will give a good solution quickly, or else the dyestuff, already in paste form, is mixed with boiling water and rubbed through a fine sieve into the bath.

In case of such treatment being necessary, the dippers, or scoops, etc., used for transferring the powdered dyestuff and the dye-paste, ought to be perfectly dry. Some dispersing or wetting-out agent may be helpful in getting a smooth suspension. In very troublesome cases it is well to let the suspension stand for a time, perhaps over night, as an imperfectly homogenous suspension will often smooth itself out, so to speak, on standing, and, if this is the case, the loss of time, if the sequence of operations in the dyehouse is well considered, will more than compensate the cost of the dispersing agent, which has not had to be used.

Some dyers, following the analogy of the procedure employed in preparing a smooth cocoa or chocolate paste (stirring up the dry cocoa-powder and sugar together and rubbing this into a smooth paste with a little water before diluting largely) have recommended mixing the dyestuff with the common or Glauber salt to be used in the bath, before adding the water to paste up the dyestuff. This, of course, only increases the difficulty of dissolving the dyestuff. The sequence should be, addition to the both of (a) a little soda solution, if necessary, to destroy the hardness of the water, should that condition exist, (b) the dyestuff suspension or paste, (c) the Glauber salt or common salt necessary for the total bath.

Formic Acid in Garment Dyeing

Lea-Faerber-Ztg. 67, 443 (1931).—A short article of general nature, commendatory of the use, and pointing out the value, of formic acid in several parts of the dyeing operation. One point mentioned is the fact that goods in whose dyeing acetic acid has been used retain a certain disagreeable odor for a considerable time afterward, while, if formic acid has been used in its place, any traces of this acid volatilize rapidly and completely. Is not the case rather one of the use of an imperfectly purified acetic acid of the "pyroligenous" type, the disagreeable odor being that of the empyreumatic compounds originating in the distillation of the wood-surce? Of course, carefully purified acetic acid, with this odor completely removed, would be much more expensive; and as formic acid, even in the most technical grade, is free from such odors, its advantages would come out even more strongly.

The absolute volatility of formic acid (which is of course shared by acetic acid to nearly the same degree, there being only about 20° difference in their boiling-points) is a strong point in its favor as against sulphuric acid, which can never be completely washed out from a fabric; and little imagination is needed to foresee the course of events as to tendering, etc., when that acid is used. Again, the dyestuff in the cotton components of the garment (if nothing more than threads in seams, bastings, etc.) is not so seriously stripped of its dyestuff by formic as by sulphuric acid, and so time and trouble in touching up such stripped portions is saved. The author still uses sulphuric acid in the dyeing of pure wool and silk, as formic acid is not so effective in removing spots and stains of metallic-oxide nature upon the material, as is sulphuric acid. Formic acid, too, has a tendency to cause the dyestuff to go on upon the fiber rather too rapidly, so that, when it is used, one is advised to enter the goods at a lower temperature than usual, especially in the case of dyestuffs which generally display an inclination to go on unevenly.

Difficulties in Dyeing Acetate Silk

O. Braun-Faerber-Ztg. 67, 242 (1931)—The difficulties commonly met with in dyeing acetate silk in particular (special difficulties apart from the general ones met with in dealing with any of the artificial fibers) are not necessarily unavoidable, i. e., inherent in the nature of the fiber, according to the author. While some of them are formidable and baffling, a skilful dyer, by calling into consideration his experience with general difficulties met with in the dyeing of the natural fibers, should be able to overcome them. The trouble is not, as has been believed, always necessarily due to the fiber's characteristics, or to defects in it. The difficulties, of course, all have to do with the attaining of level dyeings.

The chief cause of unlevel dyeings is partial or complete hydrolysis of the acetate in various parts of the goods, yarn or weave, i. e., uneven hydrolysis, for, if hydrolysis were complete in degree and extent, we should be dealing with common cellulose, which would presumably dye evenly, though probably not in the shade required or expected of the acetate silk. The trouble is specially evident with the newer dyestuffs intended specifically for acetate silk, for the older types of dyestuff frequently dye acetate

silk and cotton equally well (or poorly). With the Dispersols and similar kinds of special dyestuffs, the damaged, i. e., hydrolyzed, part of the fiber is practically not dyed, while the normal fiber is deeply dyed, in the same bath. With the basic dyestuffs, the normal fiber is dyed deeply, while the hydrolyzed parts are dyed still more deeply. The direct dyestuffs usually do not dye the normal fiber, but they do dye hydrolyzed parts well.

Non-uniformity in acetate silk is at present unavoidable, but this is likewise the case with each of the other artificial fibers; and it is less and less the case as time goes on. Difficulties from that source are becoming automatically less frequent, and also less serious when they do occur.

In dyeing any artificial fiber, including typical acetate silk, the best results are attained by adding the dyestuff gradually to the bath. This is especially important in dyeing more or less contrasting tones, or white-effects upon combinations of two or more kinds of artificial silk, such as viscose-acetate unions, or weaves containing natural and artificial fibers.

Any shading which has to be done ought to be carried out in the early stages of the dyeing, instead of at the end, as is usually the case with wool or cotton. An absolutely true tone can be attained only in this way, and trueness of tone is the more important with acetate silk, for this fiber is more transparent than are the natural fibers. If this point is not attended to, one is liable to get undesired two-color effects, visible when the goods are viewed with the light falling upon them at different angles. Shading at the end of the dyeing process will obviously dye only the surface of the fiber the color of the shading dyestuff, while the interior of the fiber is of the ground-color; and the more transparent the fiber, the more plainly the two-color effect shows up.

Dyeing any sort of fiber from a mixed bath, containing two or more dyestuffs, is always an uncertain procedure, and it is especially uncertain with acetate silk, which is so decided in its likes and dislikes toward dyestuffs. The dyer must, in these cases of mixed-bath dyeings, make himself thoroughly familiar with the affinity of each dyestuff, which is involved, toward the fiber, and this at different temperatures; and must of course, carefully work out his procedure on small lots before venturing to carry out any large-scale dyeings.

Some troubles in acetate silk dyeing are to be ascribed to tearing or breaking of the fibers in the process of weaving or finishing, or in their scouring. Greenlaugh states that the scouring bath ought to be of the same temperature as that at which the dyeing is to be carried out (75°-80°). This, however, does not seem to be generally necessary, though perhaps advisable.

Dyestuffs of Naphthophenazine Series

German Patent No. 450,922 (29/IX/'27)—*I. G. Farben-Ind. A.-G.*—German Patents Nos. 78,497 and 206,646, with additions later made, cover dyestuffs of this series, prepared by condensation of 1-3-diphenyl- or 1-3-ditolylnaphthylamines, or their derivatives, with aromatic nitroso-compounds, or by oxidizing them in mixture with p-phenylene-diamine or its derivatives. This present patent covers a similar series of products, in which the above diaryl-amino derivatives of naphthalene are replaced by 1-3-di- (4'alkoxyphenylamino)-naphthalene or its derivatives. This latter prime substance or its derivatives may be prepared by heating naphthylamine-sulphonic acids, in which the groups are meta to each other, with 4-alkyl-hydroxy-anilines, etc. G. P. No. 75,296, etc.) ffl ffl

The new products are claimed to be considerably faster to light, well leveling, and clear in tone. The examples given are of good greenish blues or pure blues. The products may, if desired, be sulphonated after condensation.

Vat Dyestuffs of Benzanthrone Series

German Patent No. 453,134 (17/XI/'28)—*I. G. Farben-Ind. A.-G.*—A benzanthronyl ether, with the oxygen in the bz-1- position, and the 2-position free, is subjected to the common caustic alkali treatment usual in this group. The radical which with the oxygen forms the ether group may be almost any aliphatic or aromatic radical, from methyl to anthraquinonyl, and in any case either the benzanthronyl or the other nucleus may be variously substituted, with the exception noted above. The condensation, as usual, may be carried out, as seems best, either with or without an inert medium being employed. Yields are very good. The four examples cover from violet to bluish-gray vat dyestuffs.

Vat Dyestuffs of Benzanthrone Series

German Patent No. 452,449 (27/X/'27)—*I. G. Farben-Ind. A.-G.*—(*Addition to German Patent No.* 436,828 *of* 15/II/'22).—The original patent covers dyestuffs obtained by halogenating those dyestuffs produced through alkylation of the oxidation-products of dibenzanthrone or its derivatives (German Patent No. 280,719 covers these halogenated vat-dyestuffs, and No. 436,828 the alkylation, and subsequent halogenation, of the original material). This present patent is merely a development of the principal patent, consisting in the halogenation and subsequent alkylation, of the substances. The example given is a bromine derivative—a brilliant blue dyestuff.

Anthraquinone Dyestuffs

German Patent No. 453,769 (1/XII/'27)—*I. G. Farben-Ind. A.-G.*—Halogenated amino-anthraquinone-sulphonic acids are the starting-point of the procedure here protected. A method of replacing a nuclear halogen by an aliphatic amino-group has been patented (German Patent No. 205,214), the substituting groups in this case being heteronuclear. The process is now extended to homonuclearly-substituted products, such as 1-amino-anthraquinone-4-halogeno-2-sulphonic acids, the use of a catalyst such as "molecular" copper or suitable copper compounds enabling the reaction to take place even at the ordinary

pressure. It is remarkable that the sulpho-group, being in the alpha position and so presumably very likely to be replaced first of all, is not attacked, at least by aliphatic amines.

Black Vat Dyestuffs of Dibenzanthrone Series

German Patent No. 448,908 (11/VIII/'27)—*Gesells. f. Chem. Ind. in Basel.* — The procedure here covered starts from the reduction-products of nitrated dibenzanthrones or violanthrones, or of their substitution products. The oxidizing agents vary from nitrosyl-sulphuric acid through chromic acid or chlorate to sulphuric acid alone. An inert medium may be used (e.g., 80 per cent acetic acid in example 1), and the oxidizing agent slowly added to the warm suspension of the amino-compound being employed. Products may be isolated by filtration. They dye cotton, from the vat, from olive-black to reddish-black, and are quite fast to chlorine.

Vat Dyestuffs of Benzanthrone Series

German Patent No. 448,262 (28/VII/'27)—*I. G. Farben-Ind. A.-G.*—Benzanthronyl sulphides and similar thioethers of benzanthrone are treated as usual with alkaline condensing agents, the products being vat dyestuffs, mostly blue to red-violet.

Pyrazolone Dyestuffs

German Patent No. 447,625 (14/VII/'27)—*Chem. Fabr. vorm. Sandoz, Basel.*—The dyestuffs falling under this procedure are at least disazo dyestuffs. Two general methods for their synthesis are given:—

a—one molecule of a tetrazotized p-diamine is coupled at one end to a molecule of an alphyl-o-hydroxycarbonic acid, and at the other end to a molecule of either 1-2'-methyl-3'-amino-5'-sulphophenyl-3-methyl-5-pyrazolone, or 1-2'-methyl-3'-amino-5'-sulphophenyl-5-pyrazolone-3-carbonic acid.

b—one molecule of the tetrazotized diamine is coupled to either of the above pyrazolones under a, at one end, and at the other to a molecule of any desired second component.

The products are distinguished by easy solubility, and so can be dyed as usual from a bath, or they can be applied as developed colors. The dyeings can be after-treated with formaldehyle to make them very fast to washing, or may be treated with such a diazo-compound as diazotized p-nitraniline, and so developed to a tris-azo dyestuff on the fiber, with, of course, increased fastness to washing, and modification of shade or tone, as the particular case may be.

Poly-azo Dyestuffs

German Patent No. 446,787 (23/VI/'27)—*Gesells, f. Chem. Ind. in Basel.*—The dyestuffs of this patent are ureas of pyrazolones. Several methods for their synthesis are described:—

a—1-amino-aryl-5-pyrazolone-3-carbonic acids are converted to their ureas by the action of phosgene in presence of substances which will neutralize the HCl set free, and these ureas are combined either with two molecules of the same diazo-compound of an aromatic amine, or with one molecule each of the diazo derivative of two different amines.

b—one molecule of an aromatic diazo-compound is coupled to one molecule of a 1-amino-aryl-5-pyrazolone-3-carbonic acid, a 1-acidyl-amino-aryl-5-pyrazolone-3-carbonic acid, or a 1-nitro-aryl-5-pyrazolone-3-carbonic acid, and the mono-azo-dyestuffs, so produced are converted to the corresponding ureas by the phosgene treatment. In this case, a nitro-group may be reduced, or an acetyl-amino group hydrolyzed, before the phosgene reaction is applied.

The amino compounds used as the origin of the diazo-compounds may be of a simple or complicated sort; e.g., in one of the three examples, one of the diazo-compounds is that derived from the coupling of diazotized 2-aminonaphthalene-4-8-disulphonic acid to alpha-naphthylamine, thus introducing an azo-group already formed.

Green Vat Dyestuffs

German Patent No. 451,549 (6/X/'27)—*Leopold Cassella u. Co.* (*addition to G. P. No.* 445,218 *of* 26/X/'24).—The original patent covers the production of blue-green to pure green vat dyestuffs, formed from 2-acylamino-perinaphthoxypenthiophenes, condensed with 1-halogeno-2-3-naphthisatine-alpha-arylides. The present additional procedure covers the use of 1-halogeno-2-3-naphthisatine-alpha-(1-halogeno-2)-arylides or alpha-chlorides, which yield yellowish-green vat dyestuffs, claimed to possess great purity of tone and decided fastness to light.

Violet Vat Dyestuffs

German Patent No. 451,411(6/X/'27)—*Leopold Cassella u. Co.*—Several patents have already been granted, covering the condensation of alpha-isatine chlorides or their halogen substitution products with hydroxythionaphthenes, with subsequent halogenation of the products in some cases. These products are inferior, in purity of tone and fastness to light, to vat dyestuffs of the anthraquinone or indanthrene series. In this case, hydroxythionaphthenes, in which the 5-7- or the 5-6-7- positions are halogenated, are condensed with halogenated alpha-isatine derivatives, in particular, the chloride or anilide, substituted with chlorine or bromine in the 5-7- position. The products are stated to be equal, in purity of tone and fastness to light, to the anthraquinone vat dyestuffs, and to be even superior to these in printing.

Vat Dyestuffs of Dibenzanthrone Series

German Patent No. 450,999 (29/IX/'27)—*I. G. Farben-Ind. A.-G.*—The procedure consists in alkaline condensation of bz-l-bz-l'-dibenzanthronyls, giving vat dyestuffs in the violet color-range. The reaction is stated to proceed with great ease at comparatively low temperatures.

U. S. Institute Elects Officers

The following directors were elected at the annual meeting of U. S. Institute in New York, Nov. 5:

For three years: C. H. Clark, Sec., U. S. Institute for Textile Research, Inc., Boston, Mass.; W. C. Taylor, Sec. and Treas., Southern Textile Assoc., Charlotte, N. C.; A. R. Mitchell, Jr., A. R. Mitchell & Son, Philadelphia, Pa.; C. R. Nichols, Treas., Otis Co., Three Rivers, Mass.; P. J. Wood, Vice-Pres., Oriental Silk Printing Co., Haledon, N. J.; P. A. Johnson, Pres. and Treas., Aspinook Co., Jewett City, Conn.; H. V. R. Scheel, Vice-Pres., Botany Consolidated Mills, Passaic, N. J.; Dr. E. H. Killheffer, Pres., Newport Chemical Works, Passaic, N. J.

For two years: K. P. Lewis, Sec. and Treas., Erwin Cotton Mills Co., Durham, N. C.; Robert West, Vice-Pres., Riverside & Dan River Cotton Mills, Danville, Va.; Jno. W. Arrington, Pres., Union Bleachery, Greenville, S. C.

The following were elected vice-presidents: Thomas T. Clark, Pres. and Treas., Talbot Mills, No. Billerica, Mass.; A. F. Bemis, Chm., Bemis Bros. Bag Co., Boston, Mass.; W. R. Blum, United Piece Dye Works, Lodi, N. J.; H. V. R. Scheel, Vice-Pres., Botany Consolidated Mills, Inc., Passaic, N. J.; K. P. Lewis, Sec. and Treas., Erwin Cotton Mills, Durham, N. C.

Re-elected to Executive Committee: Dr. E. H. Killheffer, Pres., Newport Chemical Wks., Passaic, N. J., and H. V. R. Scheel, Vice-Pres., Botany Consolidated Mills, Passaic, N. J.

P. A. Johnson, Pres. and Treas., Aspinook Co., Jewett City, Conn., and Alban Eavenson, Pres., Eavenson & Levering Co., Camden, N. J., were elected to the executive committee to succeed C. W. Causey and E. A. Clements, resigned.

Treas. E. N. Wood and Sec. C. H. Clark were re-elected.

No action was taken on the election of a president to succeed the late Dr. Stratton, first vice-pres. Thomas T. Clark continuing as acting president.

Indanthren Grey M

The General Dyestuff Corporation sends out a circular of Indanthren Grey M, which is anew homogeneous Indanthren Dyestuff, and which yields a full neutral grey on cotton, linen and other vegetable fibers and claimed to have excellent fastness to washing and boiling and very good fastness to light.

Canadian Coal Tar Products to Supply Domestic Requirements

The manufacturer of phenol, cresylic and certain other coal tar acids, and creosote compounds, recently announced by a Canadian company, is expected to supply a large proportion of domestic requirements for these products, formerly mostly imported. (Assistant Trade Commissioner Avery F. Peterson, Toronto.)

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i.e., help wanted, machinery or supplies for sale—the rate is $5.00 per column inch or less per insertion.

POSITION WANTED

DYER—Six years' experience at bleaching and dyeing wool, cotton, jute and union raw stocks and yarns. Thoroughly experienced in all stages of carpet manufacture. Age, 26; married. Address: Classified Box No. 692, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

FOREMAN DYER

Extensive experience in piece dyeing and printing. Formerly connected with two of the largest dyeing and printing plants in the country. Cotton, wool, silk, celanese, rayon, tin weighting. Regular and fast dye. Laboratory experience. Satisfactory references. Address Box No. 696, American Dyestuff Reporter, 440 Fourth Avenue, New York, N. Y.

POSITION WANTED

Research and plant chemist, 37 years old, ten years' experience leading silk dyeing and printing organizations. Capable conducting research work for improving quality silk, weighted silk, rayon, Celanese fabrics; or supervising silk or rayon chemical, dyeing operations. Full information upon request. Address Box No. 701, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

CENTRAL EUROPE

Responsible Party (Active Member AATCC) planning three or four months' trip to Central Europe will consider making investigations, securing business connections or doing similar work for part of expenses. Address Box No. 704, American Dyestuff Reporter, 440 Fourth Avenue, New York, N. Y.

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Expert soap maker specializing in olive oil foot soap chips and powder with thirty years' practical experience, is in a position to finish same within two days 100% saponified, with a very low salt consistency.

Will demonstrate my process to every interested party in producing a perfect clear olive oil foot soap splendid in color to be completed in a much shorter time than by the regular method.

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Analytical and field demonstration with previous experience in analysis and demonstration on textile oils, softeners and soaps with manufacturer New York district.

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